GE Healthcare

Voluson® 730Pro/ProV (BT05, BT08)

Service Manual

- Voluson® 730Pro/ProV systems with Serial number A34001 - A34500, A35001 -
- Voluson® 730Pro/ProV systems with Software version SW 5.0.x or higher (BT05)
- Voluson® 730Pro/ProV systems with Software version SW 5.4.x onwards (BT08)

Part Number: KTI105991
Revision: 5

CE 0123

Important Precautions

TRANSLATION POLICY

THIS SERVICE MANUAL IS AVAILABLE IN ENGLISH ONLY.

- **IF A CUSTOMER'S SERVICE PROVIDER REQUIRES A LANGUAGE OTHER THAN ENGLISH, IT IS THE CUSTOMER'S RESPONSIBILITY TO PROVIDE TRANSLATION SERVICES.**

WARNING (EN)

- **DO NOT ATTEMPT TO SERVICE THE EQUIPMENT UNLESS THIS SERVICE MANUAL HAS BEEN CONSULTED AND IS UNDERSTOOD.**
- **FAILURE TO HEED THIS WARNING MAY RESULT IN INJURY TO THE SERVICE PROVIDER, OPERATOR OR PATIENT FROM ELECTRIC SHOCK, MECHANICAL OR OTHER HAZARDS.**

CE MANUEL DE MAINTENANCE N'EST DISPONIBLE QU'EN ANGLAIS.

- **SI LE TECHNICIEN DU CLIENT A BESOIN DE CE MANUEL DANS UNE AUTRE LANGUE QUE L'ANGLAIS, C'EST AU CLIENT QU'IL INCOMBE DE LE FAIRE TRADUIRE.**

AVERTISSEMENT (FR)

- **NE PAS TENTER D'INTERVENTION SUR LES ÉQUIPEMENTS TANT QUE LE MANUEL SERVICE N'A PAS ÉTÉ CONSULTÉ ET COMPRIS.**
- **LE NON-RESPECT DE CET AVERTISSEMENT PEUT ENTRAÎNER CHEZ LE TECHNICIEN, L'OPÉRATEUR OU LE PATIENT DES BLESSURES DUES À DES DANGERS ÉLECTRIQUES, MÉCANIQUES OU AUTRES.**

DIESES KUNDENDIENST-HANDBUCH EXISTIERT NUR IN ENGLISCHER SPRACHE.

- **FALLS EIN FREMDER KUNDENDIENST EINE ANDERE SPRACHE BENÖTIGT, IST ES AUFGABE DES KUNDEN FÜR EINE ENTSPRECHENDE ÜBERSETZUNG ZU SORGEN.**

WARNUNG (DE)

- **VERSUCHEN SIE NICHT, DAS GERÄT ZU REPARIEREN, BEVOR DIESES KUNDENDIENST-HANDBUCH NICHT ZU RATE GEZOGEN UND VERSTANDEN WURDE.**
- **WIRD DIESE WARNUNG NICHT BEACHTET, SO KANN ES ZU VERLETZUNGEN DES KUNDENDIENSTTECHNIKERS, DES BEDIENERS ODER DES PATIENTEN DURCH ELEKTRISCHE SCHLÄGE, MECHANISCHE ODER SONSTIGE GEFAHREN KOMMEN.**

AVISO (ES)

ESTE MANUAL DE SERVICIO SÓLO EXISTE EN INGLÉS.

- **SI ALGÚN PROVEEDOR DE SERVICIOS AJENO A GEHC SOLICITA UN IDIOMA QUE NO SEA EL INGLÉS, ES RESPONSABILIDAD DEL CLIENTE OFRECER UN SERVICIO DE TRADUCCIÓN.**
- **NO SE DEBERÁ DAR SERVICIO TÉCNICO AL EQUIPO, SIN HABER CONSULTADO Y COMPRENDIDO ESTE MANUAL DE SERVICIO.**
- **LA NO OBSERVANCIA DEL PRESENTE AVISO PUEDE DAR LUGAR A QUE EL PROVEEDOR DE SERVICIOS, EL OPERADOR O EL PACIENTE SUFRAN LESIONES PROVOCADAS POR CAUSAS ELÉCTRICAS, MECÁNICAS O DE OTRA NATURALEZA.**

ATENÇÃO (PT-Br)

ESTE MANUAL DE ASSISTÊNCIA TÉCNICA SÓ SE ENCONTRA DISPONÍVEL EM INGLÊS.

- **SE QUALQUER OUTRO SERVIÇO DE ASSISTÊNCIA TÉCNICA, QUE NÃO A GEHC, SOLICITAR ESTES MANUAIS NOUTRO IDIOMA, É DA RESPONSABILIDADE DO CLIENTE FORNECER OS SERVIÇOS DE TRADUÇÃO.**
- **NÃO TENTE REPARAR O EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO ESTE MANUAL DE ASSISTÊNCIA TÉCNICA.**
- **O NÃO CUMPRIMENTO DESTE AVISO PODE POR EM PERIGO A SEGURANÇA DO TÉCNICO, OPERADOR OU PACIENTE DEVIDO A‘ CHOQUES ELÉTRICOS, MECÂNICOS OU OUTROS.**

AVISO (PT-pt)

ESTE MANUAL DE ASSISTÊNCIA ESTÁ DISPONÍVEL APENAS EM INGLÊS.

- **SE QUALQUER OUTRO SERVIÇO DE ASSISTÊNCIA TÉCNICA, QUE NÃO A GEHC, SOLICITAR ESTES MANUAIS NOUTRO IDIOMA, É DA RESPONSABILIDADE DO CLIENTE FORNECER OS SERVIÇOS DE TRADUÇÃO.**
- **NÃO TENTE EFECTUAR REPARAÇÕES NO EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO PREVIAMENTE ESTE MANUAL.**
- **A INOBSERVÂNCIA DESTE AVISO PODE RESULTAR EM FERIMENTOS NO TÉCNICO DE ASSISTÊNCIA, OPERADOR OU PACIENTE EM CONSEQUÊNCIA DE CHOQUE ELÉCTRICO, PERIGOS DE ORIGEM MECÂNICA, BEM COMO DE OUTROS TIPOS.**

AVVERTENZA (IT)

IL PRESENTE MANUALE DI MANUTENZIONE È DISPONIBILE SOLTANTO IN INGLESE.

- **SE UN ADDETTO ALLA MANUTENZIONE ESTERNO ALLA GEHC RICHIEDE IL MANUALE IN UNA LINGUA DIVERSA, IL CLIENTE È TENUTO A PROVVEDERE DIRETTAMENTE ALLA TRADUZIONE.**
- **SI PROCEDA ALLA MANUTENZIONE DELL’APPARECCHIATURA SOLO DOPO AVER CONSULTATO IL PRESENTE MANUALE ED AVERNE COMPRESO IL CONTENUTO.**
- **NON TENERE CONTO DELLA PRESENTE AVVERTENZA POTREBBE FAR COMPIERE OPERAZIONI DA CUI DERIVINO LESIONI ALL’ADDETTO ALLA MANUTENZIONE, ALL’UTILIZZATORE ED AL PAZIENTE PER FOLGORAZIONE ELETTRICA, PER URTI MECCANICI OD ALTRI RISCHI.**

HOIATUS (ET)

KÄESOLEV TEENINDUSJUHEND ON SAADAVAL AINULT INGLISE KEELES.

- **KUI KLIENDITEENINDUSE OSUTAJA NÕUAB JUHENDIT INGLISE KEELEST ERINEVAS KEELES, VASTUTAB KLIENT TÕLKETEENUSE OSUTAMISE EEST.**
- **ÄRGE ÜRITAGE SEADMEID TEENINDADA ENNE EELNEVALT KÄESOLEVA TEENINDUSJUHENDIGA TUTVUMIST JA SELLEST ARU SAAMIST.**
- **KÄESOLEVA HOIATUSE EIRAMINE VÕIB PÕHJUSTADA TEENUSEOSUTAJA, OPERAATORI VÕI PATSIENDI VIGASTAMIST ELEKTRILÖÖGI, MEHAANILISE VÕI MUU OHU TAGAJÄRJEL.**

VAROITUS (FI)

TÄMÄ HUOLTO-OHJE ON SAATAVILLA VAIN ENGLANNIKSI.

- **JOS ASIAKKAAN PALVELUNTARJOAJA VAATII MUUTA KUIN ENGLANNINKIELISTÄ MATERIAALIA, TARVITTAVAN KÄÄNNÖKSEN HANKKIMINEN ON ASIAKKAAN VASTUULLA.**
- **ÄLÄ YRITÄ KORJATA LAITTEISTOA ENNEN KUIN OLET VARMASTI LUKENUT JA YMMÄRTÄNYT TÄMÄN HUOLTO-OHJEEN.**
- **MIKÄLI TÄTÄ VAROITUSTA EI NOUDATETA, SEURAUKSENA VOI OLLA PALVELUNTARJOAJAN, LAITTEISTON KÄYTTÄJÄN TAI POTILAAN VAHINGOITTUMINEN SÄHKÖISKUN, MEKAANISEN VIAN TAI MUUN VAARATILANTEEN VUOKSI.**

ΠΡΟΕΙΔΟΠΟΙΗΣΗ (EL)

ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕΡΒΙΣ ΔΙΑΤΙΘΕΤΑΙ ΣΤΑ ΑΓΓΛΙΚΑ ΜΟΝΟ.

- **ΕΑΝ ΤΟ ΑΤΟΜΟ ΠΑΡΟΧΗΣ ΣΕΡΒΙΣ ΕΝΟΣ ΠΕΛΑΤΗ ΑΠΑΙΤΕΙ ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕ ΓΛΩΣΣΑ ΕΚΤΟΣ ΤΩΝ ΑΓΓΛΙΚΩΝ, ΑΠΟΤΕΛΕΙ ΕΥΘΥΝΗ ΤΟΥ ΠΕΛΑΤΗ ΝΑ ΠΑΡΕΧΕΙ ΥΠΗΡΕΣΙΕΣ ΜΕΤΑΦΡΑΣΗΣ.**
- **ΜΗΝ ΕΠΙΧΕΙΡΗΣΕΤΕ ΤΗΝ ΕΚΤΕΛΕΣΗ ΕΡΓΑΣΙΩΝ ΣΕΡΒΙΣ ΣΤΟΝ ΕΞΟΠΛΙΣΜΟ ΕΚΤΟΣ ΕΑΝ ΕΧΕΤΕ ΣΥΜΒΟΥΛΕΥΤΕΙ ΚΑΙ ΕΧΕΤΕ ΚΑΤΑΝΟΗΣΕΙ ΤΟ ΠΑΡΟΝ ΕΓΧΕΙΡΙΔΙΟ ΣΕΡΒΙΣ.**
- **ΕΑΝ ΔΕ ΛΑΒΕΤΕ ΥΠΟΨΗ ΤΗΝ ΠΡΟΕΙΔΟΠΟΙΗΣΗ ΑΥΤΗ, ΕΝΔΕΧΕΤΑΙ ΝΑ ΠΡΟΚΛΗΘΕΙ ΤΡΑΥΜΑΤΙΣΜΟΣ ΣΤΟ ΑΤΟΜΟ ΠΑΡΟΧΗΣ ΣΕΡΒΙΣ, ΣΤΟ ΧΕΙΡΙΣΤΗ Ή ΣΤΟΝ ΑΣΘΕΝΗ ΑΠΟ ΗΛΕΚΤΡΟΠΛΗΞΙΑ, ΜΗΧΑΝΙΚΟΥΣ Ή ΑΛΛΟΥΣ ΚΙΝΔΥΝΟΥΣ.**

FIGYELMEZTETÉS (HU)

EZEN KARBANTARTÁSI KÉZIKÖNYV KIZÁRÓLAG ANGOL NYELVEN ÉRHETŐ EL.

- **HA A VEVŐ SZOLGÁLTATÓJA ANGOLTÓL ELTÉRŐ NYELVRE TART IGÉNYT, AKKOR A VEVŐ FELELŐSSÉGE A FORDÍTÁS ELKÉSZÍTTETÉSE.**
- **NE PRÓBÁLJA ELKEZDENI HASZNÁLNI A BERENDEZÉST, AMÍG A KARBANTARTÁSI KÉZIKÖNYVBEN LEÍRTAKAT NEM ÉRTELMEZTÉK.**
- **EZEN FIGYELMEZTETÉS FIGYELMEN KÍVÜL HAGYÁSA A SZOLGÁLTATÓ, MŰKÖDTETŐ VAGY A BETEG ÁRAMÜTÉS, MECHANIKAI VAGY EGYÉB VESZÉLYHELYZET MIATTI SÉRÜLÉSÉT EREDMÉNYEZHETI.**

VIÐVÖRUN (IS)

ÞESSI ÞJÓNUSTUHANDBÓK ER EINGÖNGU FÁANLEG Á ENSKU.

- **EF ÞJÓNUSTUAÐILI VIÐSKIPTAMANNS ÞARFNAST ANNARS TUNGUMÁLS EN ENSKU, ER ÞAÐ Á ÁBYRGÐ VIÐSKIPTAMANNS AÐ ÚTVEGA ÞÝÐINGU.**
- **REYNIÐ EKKI AÐ ÞJÓNUSTA TÆKIÐ NEMA EFTIR AÐ HAFA SKOÐAÐ OG SKILIÐ ÞESSA ÞJÓNUSTUHANDBÓK.**
- **EF EKKI ER FARIÐ AÐ ÞESSARI VIÐVÖRUN GETUR ÞAÐ VALDIÐ MEIÐSLUM ÞJÓNUSTUVEITANDA, STJÓRNANDA EÐA SJÚKLINGS VEGNA RAFLOSTS, VÉLRÆNNAR EÐA ANNARRAR HÆTTU.**

VÝSTRAHA (CS)

TENTO SERVISNÍ NÁVOD EXISTUJE POUZE V ANGLICKÉM JAZYCE.

- **V PŘÍPADĚ, ŽE POSKYTOVATEL SLUŽEB ZÁKAZNÍKŮM POTŘEBUJE NÁVOD V JINÉM JAZYCE, JE ZAJIŠTĚNÍ PŘEKLADU DO ODPOVÍDAJÍCÍHO JAZYKA ÚKOLEM ZÁKAZNÍKA.**
- **NEPROVÁDĚJTE ÚDRŽBU TOHOTO ZAŘÍZENÍ, ANIŽ BYSTE SI PŘEČETLI TENTO SERVISNÍ NÁVOD A POCHOPILI JEHO OBSAH.**
- **V PŘÍPADĚ NEDODRŽOVÁNÍ TÉTO VÝSTRAHY MŮŽE DOJÍT ÚRAZU ELEKTRICKÁM PROUDEM PRACOVNÍKA POSKYTOVATELE SLUŽEB, OBSLUŽNÉHO PERSONÁLU NEBO PACIENTŮ VLIVEM ELEKTRICKÉHOP PROUDU, RESPEKTIVE VLIVEM K RIZIKU MECHANICKÉHO POŠKOZENÍ NEBO JINÉMU RIZIKU.**

ADVARSEL (DA)

DENNE SERVICEMANUAL FINDES KUN PÅ ENGELSK.

- **HVIS EN KUNDES TEKNIKER HAR BRUG FOR ET ANDET SPROG END ENGELSK, ER DET KUNDENS ANSVAR AT SØRGE FOR OVERSÆTTELSE.**
- **FORSØG IKKE AT SERVICERE UDSTYRET MEDMINDRE DENNE SERVICEMANUAL ER BLEVET LÆST OG FORSTÅET.**
- **MANGLENDE OVERHOLDELSE AF DENNE ADVARSEL KAN MEDFØRE SKADE PÅ GRUND AF ELEKTRISK, MEKANISK ELLER ANDEN FARE FOR TEKNIKEREN, OPERATØREN ELLER PATIENTEN.**

WAARSCHUWING (NL)

DEZE ONDERHOUDSHANDLEIDING IS ENKEL IN HET ENGELS VERKRIJGBAAR.

- **ALS HET ONDERHOUDSPERSONEEL EEN ANDERE TAAL VEREIST, DAN IS DE KLANT VERANTWOORDELIJK VOOR DE VERTALING ERVAN.**
- **PROBEER DE APPARATUUR NIET TE ONDERHOUDEN VOORDAT DEZE ONDERHOUDSHANDLEIDING WERD GERAADPLEEGD EN BEGREPEN IS.**
- **INDIEN DEZE WAARSCHUWING NIET WORDT OPGEVOLGD, ZOU HET ONDERHOUDSPERSONEEL, DE OPERATOR OF EEN PATIËNT GEWOND KUNNEN RAKEN ALS GEVOLG VAN EEN ELEKTRISCHE SCHOK, MECHANISCHE OF ANDERE GEVAREN.**

BRĪDINĀJUMS (LV)

ŠĪ APKALPES ROKASGRĀMATA IR PIEEJAMA TIKAI ANGĻU VALODĀ.

- **JA KLIENTA APKALPES SNIEDZĒJAM NEPIECIEŠAMA INFORMĀCIJA CITĀ VALODĀ, NEVIS ANGĻU, KLIENTA PIENĀKUMS IR NODROŠINĀT TULKOŠANU.**
- **NEVEICIET APRĪKOJUMA APKALPI BEZ APKALPES ROKASGRĀMATAS IZLASĪŠANAS UN SAPRAŠANAS.**
- **ŠĪ BRĪDINĀJUMA NEIEVĒROŠANA VAR RADĪT ELEKTRISKĀS STRĀVAS TRIECIENA, MEHĀNISKU VAI CITU RISKU IZRAISĪTU TRAUMU APKALPES SNIEDZĒJAM, OPERATORAM VAI PACIENTAM.**

ĮSPĖJIMAS (LT)

ŠIS EKSPLOATAVIMO VADOVAS YRA IŠLEISTAS TIK ANGLŲ KALBA.

- **JEI KLIENTO PASLAUGŲ TEIKĖJUI REIKIA VADOVO KITA KALBA – NE ANGLŲ, VERTIMU PASIRŪPINTI TURI KLIENTAS.**
- **NEMĖGINKITE ATLIKTI ĮRANGOS TECHNINĖS PRIEŽIŪROS DARBŲ, NEBENT VADOVAUTUMĖTĖS ŠIUO EKSPLOATAVIMO VADOVU IR JĮ SUPRASTUMĖTE**
- **NEPAISANT ŠIO PERSPĖJIMO, PASLAUGŲ TEIKĖJAS, OPERATORIUS AR PACIENTAS GALI BŪTI SUŽEISTAS DĖL ELEKTROS SMŪGIO, MECHANINIŲ AR KITŲ PAVOJŲ.**

ADVARSEL (NO)

DENNE SERVICEHÅNDBOKEN FINNES BARE PÅ ENGELSK.

- **HVIS KUNDENS SERVICELEVERANDØR TRENGER ET ANNET SPRÅK, ER DET KUNDENS ANSVAR Å SØRGE FOR OVERSETTELSE.**
- **IKKE FORSØK Å REPARERE UTSTYRET UTEN AT DENNE SERVICEHÅNDBOKEN ER LEST OG FORSTÅTT.**
- **MANGLENDE HENSYN TIL DENNE ADVARSELEN KAN FØRE TIL AT SERVICELEVERANDØREN, OPERATØREN ELLER PASIENTEN SKADES PÅ GRUNN AV ELEKTRISK STØT, MEKANISKE ELLER ANDRE FARER.**

OSTRZEŻENIE (PL)

NINIEJSZY PODRĘCZNIK SERWISOWY DOSTĘPNY JEST JEDYNIE W JĘZYKU ANGIELSKIM.

- **JEŚLI FIRMA ŚWIADCZĄCA KLIENTOWI USŁUGI SERWISOWE WYMAGA UDOSTĘPNIENIA PODRĘCZNIKA W JĘZYKU INNYM NIŻ ANGIELSKI, OBOWIĄZEK ZAPEWNIENIA STOSOWNEGO TŁUMACZENIA SPOCZYWA NA KLIENCIE.**
- **NIE PRÓBOWAĆ SERWISOWAĆ NINIEJSZEGO SPRZĘTU BEZ UPRZEDNIEGO ZAPOZNANIA SIĘ Z PODRĘCZNIKIEM SERWISOWYM.**
- **NIEZASTOSOWANIE SIĘ DO TEGO OSTRZEŻENIA MOżE GROZIĆ OBRAŻENIAMI CIAŁA SERWISANTA, OPERATORA LUB PACJENTA W WYNIKU PORAŻENIA PRĄDEM, URAZU MECHANICZNEGO LUB INNEGO RODZAJU ZAGROŻEŃ.**

ATENȚIE (RO)

ACEST MANUAL DE SERVICE ESTE DISPONIBIL NUMAI ÎN LIMBA ENGLEZĂ.

- **DACĂ UN FURNIZOR DE SERVICII PENTRU CLIENȚI NECESITĂ O ALTĂ LIMBĂ DECÂT CEA ENGLEZĂ, ESTE DE DATORIA CLIENTULUI SĂ FURNIZEZE O TRADUCERE.**
- **NU ÎNCERCAȚI SĂ REPARAȚI ECHIPAMENTUL DECÂT ULTERIOR CONSULTĂRII ŞI ÎNȚELEGERII ACESTUI MANUAL DE SERVICE.**
- **IGNORAREA ACESTUI AVERTISMENT AR PUTEA DUCE LA RĂNIREA DEPANATORULUI, OPERATORULUI SAU PACIENTULUI ÎN URMA PERICOLELOR DE ELECTROCUTARE, MECANICE SAU DE ALTĂ NATURĂ.**

ОСТОРОЖНО! (RU)

ДАННОЕ РУКОВОДСТВО ПО ОБСЛУЖИВАНИЮ ПРЕДОСТАВЛЯЕТСЯ ТОЛЬКО НА АНГЛИЙСКОМ ЯЗЫКЕ.

- **ЕСЛИ СЕРВИСНОМУ ПЕРСОНАЛУ КЛИЕНТА НЕОБХОДИМО РУКОВОДСТВО НЕ НА АНГЛИЙСКОМ ЯЗЫКЕ, КЛИЕНТУ СЛЕДУЕТ САМОСТОЯТЕЛЬНО ОБЕСПЕЧИТЬ ПЕРЕВОД.**
- **ПЕРЕД ОБСЛУЖИВАНИЕМ ОБОРУДОВАНИЯ ОБЯЗАТЕЛЬНО ОБРАТИТЕСЬ К ДАННОМУ РУКОВОДСТВУ И ПОЙМИТЕ ИЗЛОЖЕННЫЕ В НЕМ СВЕДЕНИЯ.**
- **НЕСОБЛЮДЕНИЕ УКАЗАННЫХ ТРЕБОВАНИЙ МОЖЕТ ПРИВЕСТИ К ТОМУ, ЧТО СПЕЦИАЛИСТ ПО ТЕХОБСЛУЖИВАНИЮ, ОПЕРАТОР ИЛИ ПАЦИЕНТ ПОЛУЧАТ УДАР ЗЛЕКТРИЧЕСКИМ ТОКОМ, МЕХАНИЧЕСКУЮ ТРАВМУ ИЛИ ДРУГОЕ ПОВРЕЖДЕНИЕ.**

ПРЕДУПРЕЖДЕНИЕ (BG)

ТОВА СЕРВИЗНО РЪКОВОДСТВО Е НАЛИЧНО САМО НА АНГЛИЙСКИ ЕЗИК.

- **АКО ДОСТАВЧИКЪТ НА СЕРВИЗНИ УСЛУГИ НА КЛИЕНТ СЕ НУЖДАЕ ОТ ЕЗИК, РАЗЛИЧЕН ОТ АНГЛИЙСКИ, ЗАДЪЛЖЕНИЕ НА КЛИЕНТА Е ДА ПРЕДОСТАВИ ПРЕВОДАЧЕСКА УСЛУГА.**
- **НЕ СЕ ОПИТВАЙТЕ ДА ИЗВЪРШВАТЕ СЕРВИЗНО ОБСЛУЖВАНЕ НА ТОВА ОБОРУДВАНЕ, ОСВЕН ВСЛУЧАЙ, ЧЕ СЕРВИЗНОТО РЪКОВОДСТВО Е ПРОЧЕТЕНО И СЕ РАЗБИРА.**
- **НЕСПАЗВАНЕТО НА ТОВА ПРЕДУПРЕЖДЕНИЕ МОЖЕ ДА ДОВЕДЕ ДО НАРАНЯВАНЕ НА ДОСТАВЧИКА НА СЕРВИЗНИ УСЛУГИ, НА ОПЕРАТОРА ИЛИ ПАЦИЕНТА ВСЛЕДСТВИЕНА ТОКОВ УДАР, МЕХАНИЧНИ ИЛИ ДРУГИ РИСКОВЕ.**

UPOZORENJE (SR)

OVAJ PRIRUČNIK ZA SERVISIRANJE DOSTUPAN JE SAMO NA ENGLESKOM JEZIKU.

- **AKO KLIJENTOV SERVISER ZAHTEVA JEZIK KOJI NIJE ENGLESKI, ODGOVORNOST JE NA KLIJENTU DA PRUŽI USLUGE PREVOĐENJA.**
- **NEMOJTE POKUŠAVATI DA SERVISIRATE OPREMU AKO NISTE PROČITALI I RAZUMELI PRIRUČNIK ZA SERVISIRANJE.**
- **AKO NE POŠTUJETE OVO UPOZORENJE, MOŽE DOĆI DO POVREĐIVANJA SERVISERA, OPERATERA ILI PACIJENTA UZROKOVANOG ELEKTRIČNIM UDAROM, MEHANIČKIM I DRUGIM OPASNOSTIMA.**

OPOZORILO (SL)

TA SERVISNI PRIROČNIK JE NA VOLJO SAMO V ANGLEŠČINI.

- **ČE PONUDNIK SERVISNIH STORITEV ZA STRANKO POTREBUJE NAVODILA V DRUGEM JEZIKU, JE ZA PREVOD ODGOVORNA STRANKA SAMA.**
- **NE POSKUŠAJTE SERVISIRATI OPREME, NE DA BI PREJ PREBRALI IN RAZUMELI SERVISNI PRIROČNIK.**
- **ČE TEGA OPOZORILA NE UPOŠTEVATE, OBSTAJA NEVARNOST ELEKTRIČNEGA UDARA, MEHANSKIH ALI DRUGIH NEVARNOSTI IN POSLEDIČNIH POŠKODB PONUDNIKA SERVISNIH STORITEV, UPORABNIKA OPREME ALI PACIENTA.**

UPOZORENJE (HR)

OVAJ SERVISNI PRIRUČNIK DOSTUPAN JE SAMO NA ENGLESKOM JEZIKU.

- **AKO KLIJENTOV SERVISER ZAHTIJEVA JEZIK KOJI NIJE ENGLESKI, ODGOVORNOST KLIJENTA JE PRUŽITI USLUGE PREVOĐENJA.**
- **NEMOJTE POKUŠAVATI SERVISIRATI OPREMU AKO NISTE PROČITALI I RAZUMJELI SERVISNI PRIRUČNIK.**
- **AKO NE POŠTUJETE OVO UPOZORENJE, MOŽE DOĆI DO OZLJEDE SERVISERA, OPERATERA ILI PACIJENTA PROUZROČENE STRUJNIM UDAROM, MEHANIČKIM I DRUGIM OPASNOSTIMA.**

UPOZORNENIE (SK)

TÁTO SERVISNÁ PRÍRUČKA JE K DISPOZÍCII LEN V ANGLIČTINE.

- **AK ZÁKAZNÍKOV POSKYTOVATEĽ SLUŽIEB VYŽADUJE INÝ JAZYK AKO ANGLIČTINU, POSKYTNUTIE PREKLADATEĽSKÝCH SLUŽIEB JE ZODPOVEDNOSŤOU ZÁKAZNÍKA.**
- **NEPOKÚŠAJTE SA VYKONÁVAŤ SERVIS ZARIADENIA SKÔR, AKO SI NEPREČÍTATE SERVISNÚ PRÍRUČKU A NEPOROZUMIETE JEJ.**
- **ZANEDBANIE TOHTO UPOZORNENIA MÔŽE VYÚSTIŤ DO ZRANENIA POSKYTOVATEĽA SLUŽIEB, OBSLUHUJÚCEJ OSOBY ALEBO PACIENTA ELEKTRICKÝM PRÚDOM, PRÍPADNE DO MECHANICKÉHO ALEBO INÉHO NEBEZPEČENSTVA.**

VARNING (SV)

DEN HÄR SERVICEHANDBOKEN FINNS BARA TILLGÄNGLIG PÅ ENGELSKA.

- **OM EN KUNDS SERVICETEKNIKER HAR BEHOV AV ETT ANNAT SPRÅK ÄN ENGELSKA ANSVARAR KUNDEN FÖR ATT TILLHANDAHÅLLA ÖVERSÄTTNINGSTJÄNSTER.**
- **FÖRSÖK INTE UTFÖRA SERVICE PÅ UTRUSTNINGEN OM DU INTE HAR LÄST OCH FÖRSTÅR DEN HÄR SERVICEHANDBOKEN.**
- **OM DU INTE TAR HÄNSYN TILL DEN HÄR VARNINGEN KAN DET RESULTERA I SKADOR PÅ SERVICETEKNIKERN, OPERATÖREN ELLER PATIENTEN TILL FÖLJD AV ELEKTRISKA STÖTAR, MEKANISKA FAROR ELLER ANDRA FAROR.**

DİKKAT (TR)

BU SERVİS KILAVUZU YALNIZCA İNGİLİZCE OLARAK SAĞLANMIŞTIR.

- **EĞER MÜŞTERİ TEKNİSYENİ KILAVUZUN İNGİLİZCE DIŞINDAKİ BİR DİLDE OLMASINI İSTERSE, KILAVUZU TERCÜME ETTİRMEK MÜŞTERİNİN SORUMLULUĞUNDADIR.**
- **SERVİS KILAVUZUNU OKUYUP ANLAMADAN EKİPMANLARA MÜDAHALE ETMEYİNİZ.**
- **BU UYARININ GÖZ ARDI EDİLMESİ, ELEKTRİK ÇARPMASI YA DA MEKANİK VEYA DİĞER TÜRDEN KAZALAR SONUCUNDA TEKNİSYENİN, OPERATÖRÜN YA DA HASTANIN YARALANMASINA YOL AÇABİLİR.**

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(KO)

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SERVICE SAFETY CONSIDERATIONS

DANGER **DANGEROUS VOLTAGES, CAPABLE OF CAUSING DEATH, ARE PRESENT IN THIS EQUIPMENT. USE EXTREME CAUTION WHEN HANDLING, TESTING AND ADJUSTING.**

WARNING ***Use all Personal Protection Equipment (PPE) such as gloves, safety shoes, safety glasses, and kneeling pad, to reduce the risk of injury.***

For a complete review of all safety requirements, see the Chapter 1, Safety Considerations section in the Service Manual.

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Revision History

Revision	Date	Reason for change
1	July 01, 2005	Initial Release (from Software Version 5.0.x onwards)
2	Jannuary 31, 2007	Special regulation for Korea
3	November, 2007	Implementation of new parts, release of BT08 software version (SW 5.4.x)
4	June, 2009	Implementation of new parts, release of BT08 software version (SW5.4.1 or higher), Implementation of Appendix A (Acoustic Output & Index Determination Tables)
5	September, 2012	General Update

List of Effected Pages

Pages	Revision	Pages	Revision	Pages	Revision
Title Page	5	Chapter 3 - Setup Instructions pages 3-1 to 3-74	5	Chapter 9 - Renewal Parts pages 9-1 to 9-40	5
Important Precautions (incl. Legal Notes) pages i to xi	5	Chapter 4 - Functional Checks pages 4-1 to 4-46	5	Chapter 10 - Care & Maintenance pages 10-1 to 10-24	5
Rev History/LOEP page xii	5	Chapter 5 - Components and Functions (Theory) pages 5-1 to 5-62	5	Chapter A - Acoustic Output & Index Determination Tables pages A-1 to A-106	5
Table of Contents pages xiii to xxxii	5	Chapter 6 - Service Adjustments pages 6-1 to 6-10	5	Index pages I to VIII	5
Chapter 1 - Introduction pages 1-1 to 1-16	5	Chapter 7 - Diagnostics/ Troubleshooting pages 7-1 to 7-30	5	Back Cover	5
Chapter 2 - Site Preparation pages 2-1 to 2-8	5	Chapter 8 - Replacement Procedures pages 8-1 to 8-28	5		

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Chapter 1
Introduction

Section 1-1
Overview

1-1-1 Purpose of Chapter 1

This chapter describes important issues related to safely servicing the Voluson® 730Pro/ProV scanner. The service provider must read and understand all the information presented in this manual before installing or servicing a unit.
Always observe the instructions given in the manual of the peripheral/auxiliary device.

Under consideration of general maintenance requirements a minimum lifetime of 7 years for the equipment and 5 years for the probes may be expected. Have the system checked and serviced in regular intervals (once per year) by authorized service personnel.

Table 1-1 Contents in Chapter 1

Section	Description	Page Number
1-1	Overview	1-1
1-2	Important Conventions	1-4
1-3	Safety Considerations	1-9
1-4	Electromagnetic Compatibility (EMC)	1-14
1-5	Customer Assistance	1-15

1-1-2 Purpose of Service Manual

This Service Manual provides installation and service information for the Voluson® 730Pro/ProV Ultrasound Scanning System and contains the following chapters:

1.) **Chapter 1 - Introduction:** Contains a content summary and warnings.
2.) **Chapter 2 - Site Preparation:** Contains pre-installation requirements for the Voluson® 730Pro/ProV.
3.) **Chapter 3 - Setup Instructions:** Contains installation procedures.
4.) **Chapter 4 - Functional Checks:** Contains functional checks that are recommended as part of the installation, or as required during servicing and periodic maintenance.
5.) **Chapter 5 - Components and Functions (Theory):** Contains block diagrams and functional explanations of the electronics.
6.) **Chapter 6 - Service Adjustments:** Contains instructions on how to make available adjustments to the Voluson® 730Pro/ProV.
7.) **Chapter 7 - Diagnostics/Troubleshooting:** Provides procedures for running diagnostic or related routines for the Voluson® 730Pro/ProV.
8.) **Chapter 8 - Replacement Procedures:** Provides disassembly procedures and reassembly procedures for all changeable Field Replaceable Units (FRU).
9.) **Chapter 9 - Renewal Parts:** Contains a complete list of field replaceable parts for the Voluson® 730Pro/ProV.
10.) **Chapter 10 - Care & Maintenance:** Provides periodic maintenance procedures for the Voluson® 730Pro/ProV.

1-1-3 Typical Users of the Basic Service Manual

- Service Personnel (installation, maintenance, etc.).
- Hospital's Service Personnel
- Contractors (Some parts of Chapter 2 - Pre-Installation)

1-1-4 Voluson® 730Pro/ProV Models Covered by this Manual

Table 1-2 Voluson® 730Pro Model Designations

Part Number	Description	BT version
H48651FF	Voluson® 730Pro Console 230V/50Hz	BT05
H48651FG	Voluson® 730Pro Console 115V USA	BT05
H48651FH	Voluson® 730Pro Console 115V	BT05
H48651FJ	Voluson® 730Pro Console 100V JAPAN	BT05
H48651FK	Voluson® 730Pro Console 230V KOREA	BT05
H48651FL	Voluson® 730Pro Console 230V CHINA	BT05
H48651FM	Voluson® 730Pro Console 230V AUSTRALIA	BT05
H48651FN	Voluson® 730Pro Console 230V INDIA	BT05
H48671DH	Voluson® 730Pro Console 230V/50Hz	BT08
H48671DJ	Voluson® 730Pro Console 115V USA	BT08
H48671DL	Voluson® 730Pro Console 100V JAPAN	BT08
H48671DM	Voluson® 730Pro Console 230V KOREA	BT08
H48671DN	Voluson® 730Pro Console 230V CHINA	BT08
H48671DP	Voluson® 730Pro Console 230V AUSTRALIA	BT08
H48671DR	Voluson® 730Pro Console 230V INDIA	BT08

NOTICE **The** Voluson® 730Pro/ProV **V is a downgraded version of the** Voluson® 730Pro/ProV**.** That means not all options are available on the Voluson® 730Pro/ProV (marked with * in the sections of the Manuals).

The Voluson® 730Pro/ProV V is **only distinguished by the System type**, see: Figure 7-1: System Setup - System Info page (e.g. V730 Pro) on page 7-2; it has **NO** own serial number!

Table 1-3 Voluson® 730ProV Model Designations

Part Number	Description	BT version
H48651GL	Voluson® 730ProV Console 230V/50Hz	BT05
H48651GM	Voluson® 730ProV Console 115V USA	BT05
H48651GN	Voluson® 730ProV Console 115V	BT05
H48651GP	Voluson® 730ProV Console 100V JAPAN	BT05
H48651GR	Voluson® 730ProV Console 230V KOREA	BT05
H48651GS	Voluson® 730ProV Console 230V CHINA	BT05
H48651GT	Voluson® 730ProV Console 230V AUSTRALIA	BT05
H48651GW	Voluson® 730ProV Console 230V INDIA	BT05

Table 1-3 Voluson® 730ProV Model Designations

Part Number	Description	BT version
H48671B	Voluson® 730ProV Console 230V/50Hz	BT08
H48671BA	Voluson® 730ProV Console 115V USA	BT08
H48671BD	Voluson® 730ProV Console 100V JAPAN	BT08
H48671BE	Voluson® 730ProV Console 230V KOREA	BT08
H48671BF	Voluson® 730ProV Console 230V CHINA	BT08
H48671BG	Voluson® 730ProV Console 230V AUSTRALIA	BT08
H48671BJ	Voluson® 730ProV Console 230V INDIA	BT08

1-1-5 System History - Hardware and Software Versions

This manual applies to Voluson® 730Pro/ProV systems with Serial number A34001 - A34500 and/or A35001 - (onwards), with:

- Software version 5.0.x (BT05) installed
- Software version 5.1.x (BT05) installed
- Software version 5.2.x (BT05) installed
- Software version 5.3.x (BT05) installed
- Software version 5.4.x (BT08) installed

NOTICE Voluson® 730Pro/ProV systems that were upgraded to **BT05** (serial number less than < A34000) have different hardware installed. For upgraded systems, please refer to BT04 manual (KTI105947).

1-1-6 Purpose of Operator Manual(s)

The Operator Manual(s) should be fully read and understood before operating the Voluson® 730Pro/ProV and also kept near the unit for quick reference.

Section 1-2
Important Conventions

1-2-1 Conventions Used in Book

Model Designations

This manual covers the Voluson® 730Pro/ProV ultrasound units listed in Table 1-2 on page 1-2 respectively Table 1-3 on page 1-2.

Icons

Pictures, or icons, are used wherever they reinforce the printed message. The icons, labels and conventions used on the product and in the service information are described in this chapter.

Safety Precaution Messages

Various levels of safety precaution messages may be found on the equipment and in the service information. The different levels of concern are identified by a flag word that precedes the precautionary message. Known or potential hazards are labeled in one of following ways:

DANGER **INDICATES THE PRESENCE OF A HAZARD THAT WILL CAUSE SEVERE PERSONAL INJURY OR DEATH IF THE INSTRUCTIONS ARE IGNORED.**

WARNING ***INDICATES THE PRESENCE OF A HAZARD THAT CAN CAUSE SEVERE PERSONAL INJURY AND PROPERTY DAMAGE IF INSTRUCTIONS ARE IGNORED.***

CAUTION **Indicates the presence of a hazard that will or can cause minor personal injury and property damage if instructions are ignored.**

NOTICE **Equipment Damage Possible**

Notice is used when a hazard is present that can cause property damage but has absolutely no personal injury risk.

Example: Disk drive will crash.

BT Version: Is used when options or features are specific for BT-Software versions.

NOTE: Notes provide important information about an item or a procedure.
Information contained in a NOTE can often save you time or effort.

1-2-2 Standard Hazard Icons

Important information will always be preceded by the exclamation point contained within a triangle, as seen throughout this chapter. In addition to text, several different graphical icons (symbols) may be used to make you aware of specific types of hazards that could cause harm.

Table 1-4 Standard Hazard Icons

ELECTRICAL	MECHANICAL	RADIATION
LASER	**HEAT**	**PINCH**

Other hazard icons make you aware of specific procedures that should be followed.

Table 1-5 Standard Icons Indicating a Special Procedure be Used

AVOID STATIC ELECTRICITY	TAG AND LOCK OUT	WEAR EYE PROTECTION
WEAR HAND PROTECTION	**WEAR FOOT PROTECTION**	**or**

1-2-3 Product Labels and Icons

The following table describes the purpose and location of safety labels and other important information provided on the equipment.

BT Version: Product labels and its location depend on BT-version and/or date of manufacture. For description of all symbols and labels used on the system, refer to Chapter 2 in the Basic User Manual of your system.

Table 1-6 Product Icons

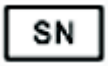
LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
Identification and Rating Plate	Manufacturer's name and address Model and serial numbers Electrical ratings	Rear side of the unit Monitor rear side on each probe
	Manufacturer's name and address	Identification and Rating Plate(rear side of the unit / on plug of each probe)
	Date of manufacture	Identification and Rating Plate(rear side of the unit / on plug of each probe)
	Serial number	Identification and Rating Plate(rear side of the unit / on plug of each probe)
	Catalog or model number	Identification and Rating Plate(rear side of the unit / on plug of each probe)
Device Listing/Certification Labels	Laboratory logo or labels denoting conformance with industry safety standards such as UL or IEC.	Rear side of the unit Rear side of the monitor
CE 0123	Council Directive 93/42/EEC concerning medical devices: The CE mark affixed to the equipment testifies compliance to the directive.	Rear side of the unit on the plug of each probe
	"Tested and production monitored by TÜV Product Service NRTL with respect to ELECTRICAL SHOCK, FIRE and MECHANICAL HAZARDS only in accordance with UL2601-1 and CAN/CSA C22.2 NO.601.1."	Identification and Rating Plate (rear side of the unit)
Type/Class Label	Used to indicate the degree of safety or protection.	
IP Code (IPX 0) IP Code (IPX 1) IP Code (IPX 7)	degree of protection provided by the enclosure per IEC 60529: IPX 0 - no protection against ingress of water IPX 1 - protected against dripping water IPX 7 - protected against the effects of immersion	various
	Equipment Type BF (man in the box symbol) IEC 878-02-03 indicates B Type equipment having even more electrical isolation than standard Type B equipment because it is intended for intimate patient contact.	Probe connectors Front side of the ECG-preamplifier (MAN) Rear of Power Supply

Table 1-6 Product Icons (Continued)

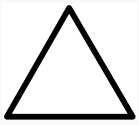
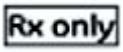
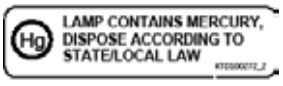
LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	To identify a defibrillation-proof type CF (heart in box with “electrodes”, symbol IEC 60878-5336) applied part complying with IEC 60601-1.	Front side of the ECG-preamplifier
“CAUTION This unit weighs... Special care must be used to avoid..." 	This precaution is intended to prevent injury that may result if one person attempt to move the unit considerable distances or on an incline due to the weight of the unit.	Used in the Service and User Manual which should be adjacent to equipment at all times for quick reference.
	Pushing prohibited. Do not lean on the system. Tipping danger. Take special care when moving the system	various
	Loading prohibited. Do not put any items on this shelf. Danger of breaking. Also items might be crushed when lowering the user interface.	at top cover of the system
	“ATTENTION” - Read and understand all instructions for use” This symbol advises the reader to consult the accompanying documents (operator manual or other instructions).	rear side of the unit
"DANGER - Risk of explosion used in..."	The system is not designed for use with flammable anesthetic gases.	Indicated in the Service Manual.
	"CAUTION" The equilateral triangle is usually used in combination with other symbols to advise or warn the user.	various
	ATTENTION - Consult accompanying documents " is intended to alert the user to refer to the operator manual or other instructions when complete information cannot be provided on the label.	Rear side of Power Supply
	"CAUTION - Dangerous voltage" (the lightning flash with arrowhead in equilateral triangle) is used to indicate electric shock hazards.	Rear side of Monitor
	"Mains OFF" Indicates the power off position of the mains power switch.	rear of system at mains switch (on primary power supply - RTN)
	"OFF/Standby" Indicates the power off/standby position of the power switch. **CAUTION** **This Power Switch DOES NOT ISOLATE Mains Supply**	Adjacent to On-Off/Standby switch left below the Control panel.

Table 1-6 Product Icons (Continued)

LABEL/SYMBOL	PURPOSE/MEANING	LOCATION
	"Mains ON" Indicates the power on position of the mains power switch.	rear of system at mains switch (on primary power supply - RTN)
	ON switch of the isolation transformer for auxiliary devices.	Rear of system at the switch for auxiliary devices (F2)
	OFF switch of the isolation transformer for auxiliary devices.	Rear of system at the switch for auxiliary devices (F2)
	"Protective Earth" Indicates the protective earth (grounding) terminal.	rear of system at mains switch (on primary power supply - RTN)
	"Equipotentiality" Indicates the terminal to be used for connecting equipotential conductors when interconnecting (grounding) with other equipment.	rear of system at mains switch (on primary power supply - RTN)
	Waste Electrical and Electronic Equipment (WEEE) Disposal. This symbol indicates that waste electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.	Rear side of the unit on the plug of each probe
	This symbol indicates that in the United States of America, federal law restricts this device to sale by or on the order of a physician.	Identification and Rating Plate (rear side of the unit)
	GOST-R label (Russia Regulatory Country Clearance)	Identification and Rating Plate (rear side of the unit)
	These symbols indicate that at least one of the six hazardous substances of the China RoHS Labelling Standard is above the RoHS limitation. The number inside the circle is referred to as the Environmental Friendly Use Period (EFUP). It indicates the number of years that the product, under normal use, will remain harmless to health of humans or the environment. EFUP = 10 for Short Use Products EFUP = 20 for Medium Use Products	Rear side of the unit on the plug of each probe
	This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws.	Rear side of the unit

Section 1-3
Safety Considerations

1-3-1 Introduction

The following safety precautions must be observed during all phases of operation, service and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual, violates safety standards of design, manufacture and intended use of the equipment.

1-3-2 Human Safety

Operating personnel must not remove the system covers. Servicing should be performed by authorized personnel only. Only personnel who have participated in a Voluson® 730Pro/ProV Training are authorized to service the equipment.

1-3-3 Mechanical Safety

WARNING ***USE EXTREME CAUTION WHEN ELEVATING THE UNIT, OR IF IT IS RAISED FOR A REPAIR OR MOVED ALONG ANY INCLINE. IT MAY BECOME UNSTABLE WHICH COULD CAUSE THE UNIT TO TIP OVER.***

WARNING ***ULTRASOUND PROBES ARE HIGHLY SENSITIVE MEDICAL INSTRUMENTS THAT CAN EASILY BE DAMAGED BY IMPROPER HANDLING. USE CARE WHEN HANDLING AND PROTECT FROM DAMAGE WHEN NOT IN USE. DO NOT USE A DAMAGED OR DEFECTIVE PROBE. FAILURE TO FOLLOW THESE PRECAUTIONS CAN RESULT IN SERIOUS INJURY AND EQUIPMENT DAMAGE.***

WARNING ***NEVER USE A PROBE THAT HAS FALLEN TO THE FLOOR. EVEN IF IT LOOKS OK, IT MAY BE DAMAGED.***

CAUTION **Always lower and center the Operator I/O Panel before moving the scanner.**

CAUTION **The Voluson® 730Pro/ProV weighs 136 kg or more, depending on installed peripherals, (300 lbs., or more) when ready for use.**

Care must be used when moving it or replacing its parts. Failure to follow the precautions listed could result in injury, uncontrolled motion and costly damage.

ALWAYS:

• Use the handle to move the system. • Be sure the pathway is clear.
• Use slow, careful motions. • Do not let the system strike walls or door frames.

Two people are required when moving on inclines or lifting more than 16 kg (35 lbs).

CAUTION **Keep the heat venting holes on the monitor unobstructed to avoid overheating of the monitor.**

NOTE: Special care should be taken when transporting the unit in a vehicle:

- *Secure the systems with straps in an upright position and lock the caster wheels (brake).*
- *DO NOT use the Control Panel as an anchor point.*
- *Place the probes in their carrying case.*
- *Eject any DVD, CD or Magneto Optical disk (MOD) from their drive.*
- *Ensure that the Voluson® 730Pro/ProV system is firmly secured while inside the vehicle.*
- *Prevent vibration damage by driving cautiously.*
  Avoid unpaved roads, excessive speeds, and erratic stops or starts.

1-3-4 Electrical Safety

1-3-4-1 Safe Practices

To minimize shock hazard, the equipment chassis must be connected to an electrical ground. The system is equipped with a three-conductor AC power cable. This must be plugged into an approved electrical outlet with safety ground. If an extension cord is used with the system, make sure that the total current rating of the system does not exceed the extension cord rating.

The power outlet used for this equipment should not be shared with other types of equipment.

Both the system power cable and the power connector meet international electrical standards.

WARNING ***CONNECTING A VOLUSON® 730PRO/PROV SCANNER TO THE WRONG VOLTAGE LEVEL WILL MOST LIKELY DESTROY THE SCANNER.***

1-3-4-2 Probes

All the probes for the Voluson® 730Pro/ProV are designed and manufactured to provide trouble-free, reliable service. To ensure this, correct handling of probes is important and the following points should be noted:

- Do not drop a probe or strike it against a hard surface, as this may damage the transducer elements, acoustic lens, or housing.
- Inspect the probe prior to each use for damage or degradation to the Housing, Cable strain relief, Lens and Seal.
- Do not use a cracked or damaged probe. In this event, call your field service representative immediately to obtain a replacement.
- Avoid pulling, pinching or kinking the probe cable, since a damaged cable may compromise the electrical safety of the probe.
- To avoid the risk of a probe accidentally falling, do not allow the probe cables to become entangled, or to be caught in the machine's wheels.
- Never immerse the probe connector or adapter into any liquid.

NOTE: For detailed information on handling probes, refer to the Voluson® 730Pro/ProV Basic User Manual and the care card supplied with the probe.

1-3-5 Auxiliary Devices Safety

WARNING ***Power Supplies for additional equipment MUST comply with IEC 60601-1.***

WARNING ***DO NOT attempt to use different peripherals and accessories (brand and model; connected via the PCMCIA or USB ports) other than approved and provided by GE Healthcare!***
The ultrasound system is an extremely sensitive and complex medical system. Any unauthorized peripherals may cause system failure or damage!

The Voluson® 730Pro/ProV is equipped with an isolation transformer to provide the required separation from mains for both, the system and the auxiliary devices.
One AUX main outlet is located at the primary power supply. It is used for connecting the threefold splitter whose outlets are led to the shelves intend for auxiliary devices (e.g., printers) and the AUX main outlet that is accessible on the back of the control console.

The IEC 60601-1-1 standard provides a guideline for safely interconnecting medical devices in systems. “Equipment connected to the analog or digital interface must comply with the respective IEC/UL standards (e.g. IEC 60950 / UL 60950 for data processing equipment and IEC 60601-1 / UL 60601-1 for medical equipment). Everybody who connects additional equipment to the signal input portion or signal output portion configures a medical system, and is therefore responsible that the system complies with the requirements of the system standard IEC 60601-1-1.

Special care has to be taken, if the device is connected to computer network (e.g., Ethernet), because other devices could be connected without any control. There could be a potential difference between the protective earth and any line of the computer network including the shield.

In this case the only way to operate the system safely is to use an isolated signal link with minimum 4mm creepage distance, 2.5mm air clearance of the isolation device. For computer networks there are media converters available which convert the electrical to optical signals. Please consider that this converter has to comply with IEC xxx standards***** and is battery operated.

***** IEC xxx stands for standards such as:

- IEC 60601 for medical devices
- IEC 60950 for information technology equipment etc.

NOTICE **The system integrator** (any person connecting the medical device to other devices) **is responsible that the connections are safe.**
If in doubt, consult the technical service department or your local representative.

CAUTION **The leakage current of the entire system including any / all auxiliary equipment must not exceed the limit values as per EN 60601-1-1:1990 (IEC 60601-1-1) respectively other valid national or international standards. All equipment must comply with UL, CSA and IEC requirements.**

CAUTION **Please observe that some printers may not be medical devices! If the Bluetooth Printer and/or Line Printers are no medical devices, they have to be located outside of the patient environment (according to IEC 60601-1 / UL 60601-1).**

1-3-5 Auxiliary Devices Safety (cont'd)

CAUTION **Auxiliary equipment must only be connected to the main console with the special main outlet provided for the electrical safety of the system.**

For hardware installation procedures see: Section 3-5 "Connection of Auxiliary Devices" on page 3-9.

WARNING ***After each installation, the leakage currents have to be measured according to IEC 60601-1 respectively UL 60601-1 (see: Section 10-7-2 on page 10-16).***

NOTICE All peripherals mounted on the Voluson® 730Pro/ProV system chassis must be firmly secured in position.

1-3-6 Labels Locations

The Voluson® 730Pro/ProV system comes equipped with product labels and icons.
These labels and icons represent pertinent information regarding the operation of the unit.

BT Version: Product labels and its location depend on BT-version and/or date of manufacture.
Refer to Section 1-2-3 on page 1-6 and Chapter 2 in the Basic User Manual of your system.

Figure 1-1 Labeling

1.)Caution
2.)WEEE Disposal Icon
3.)CE Label
4.)UL Label (not on all systems, depend on date and location of manufacturing)
5.)Identification "Main" Label
6.)CW-Doppler (only if the CW-Doppler option is installed)
7.)Rating Label (only at systems made in Korea)
8.)Quality Control Label
9.)place for addtional label (e.g., "Homologation label" for Japan or China only)

1-3-7 Dangerous Procedure Warnings

Warnings, such as the examples below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

DANGER **DANGEROUS VOLTAGES, CAPABLE OF CAUSING DEATH, ARE PRESENT IN THIS EQUIPMENT.**
USE EXTREME CAUTION WHEN HANDLING, TESTING AND ADJUSTING.

WARNING ***EXPLOSION WARNING***

DO NOT OPERATE THE EQUIPMENT IN AN EXPLOSIVE ATMOSPHERE. OPERATION OF ANY ELECTRICAL EQUIPMENT IN SUCH AN ENVIRONMENT CONSTITUTES A DEFINITE SAFETY HAZARD.

WARNING ***DO NOT SUBSTITUTE PARTS OR MODIFY EQUIPMENT***

BECAUSE OF THE DANGER OF INTRODUCING ADDITIONAL HAZARDS, DO NOT INSTALL SUBSTITUTE PARTS OR PERFORM ANY UNAUTHORIZED MODIFICATION OF THE EQUIPMENT.

1-3-8 Lockout/Tagout Requirements (For USA Only)

Follow OSHA Lockout/Tagout requirements to protect service personnel from injuries caused by unexpected energizing or start-up of equipment during service, repair, or maintenance.

NOTICE Energy Control and Power Lockout for Voluson® 730Pro/ProV.

When servicing parts of the system where there is exposure to voltage greater than 30 Volts:
Unplug the system
Maintain control of the system power plug
There are no test points to verify isolation, you must wait for at least 20 seconds for capacitors to discharge.

Beware that the Power Supply (CPN), Front End Processor and Back End Processor may be energized even if the power is turned off when the cord is still plugged into the AC Outlet.

1-3-9 Returning/Shipping Probes and Repair Parts

Equipment being returned must be clean and free of blood and other infectious substances.

GEMS policy states that body fluids must be properly removed from any part or equipment prior to shipment. GEMS employees, as well as customers, are responsible for ensuring that parts/equipment have been properly decontaminated prior to shipment. Under no circumstance should a part or equipment with visible body fluids be taken or shipped from a clinic or site (for example, body coils or and ultrasound probe).

The purpose of the regulation is to protect employees in the transportation industry, as well as the people who will receive or open this package.

NOTE: *The US Department of Transportation (DOT) has ruled that "items what were saturated and/or dripping with human blood that are now caked with dried blood; or which were used or intended for use in patient care" are "regulated medical waste" for transportation purpose and must be transported as a hazardous material.*

Section 1-4
Electromagnetic Compatibility (EMC)

1-4-1 What is EMC?

Electromagnetic compatibility describes a level of performance of a device within its electromagnetic environment. This environment consists of the device itself and its surroundings including other equipment, power sources and persons with which the device must interface. Inadequate compatibility results when a susceptible device fails to perform as intended due interference from its environment or when the device produces unacceptable levels of emission to its environment. This interference is often referred to as radio–frequency or electromagnetic interference (RFI/EMI) and can be radiated through space or conducted over interconnecting power of signal cables. In addition to electromagnetic energy, EMC also includes possible effects from electrical fields, magnetic fields, electrostatic discharge and disturbances in the electrical power supply.

For applicable standards refer to Chapter 2 in the Basic User Manual of the Voluson® 730Pro/ProV.

1-4-2 Compliance

The Voluson® 730Pro/ProV unit conforms to all applicable conducted and radiated emission limits and to immunity from electrostatic discharge, radiated and conducted RF fields, magnetic fields and power line transient requirements.

NOTE: ***For CE Compliance, it is critical that all covers, screws, shielding, gaskets, mesh, clamps, are in good condition, installed tightly without skew or stress. Proper installation following all comments noted in this service manual is required in order to achieve full EMC performance.***

1-4-3 Electrostatic Discharge (ESD) Prevention

WARNING ***DO NOT touch any boards with integrated circuits prior to taking the necessary ESD precautions:***

1.) When installing boards, ESD may cause damage to a board.
ALWAYS connect yourself, via an arm-wrist strap, to the advised ESD connection point located on the rear of the system (to the right of the power connector).

2.) Follow general guidelines for handling of electrostatic sensitive equipment.

WARNING ***Risk of electrical shock, system must be turned off.***
Avoid all contact with electrical contacts, conductors and components.
Always use non-conductive handles designed for the removal and replacement of ESD sensitive parts. All parts that have the potential for storing energy must be discharged or isolated before making contact.

Section 1-5
Customer Assistance

1-5-1 Contact Information

If this equipment does not work as indicated in this service manual or in the Basic User Manual, or if you require additional assistance, please contact the local distributor or appropriate support resource, as listed below.

NOTE: Prepare vital system information (see: Section 7-2 on page 7-2) before you call:

- System Type
- System Serial number (also visible on label on back of the system)
- Application Software version
- Backup version
- additional information about installed software

Table 1-7 Phone Numbers for Customer Assistance

Location	Phone Number	
USA GE Medical Systems Ultrasound Service Engineering 9900 Innovation Drive (RP-2123) Wauwatosa, WI 53226, USA	Service: On-site Service Parts Applications Support	1-800-437-1171 1-800-558-2040 1-800-682-5327 or 1-262-524-5698
Canada		1-800-668-0732
Latin America	Service Applications support	1-800-321-7937 1-262-524-5698
Europe GE Ultraschall Deutschland GmbH Beethovenstraße 239 Postfach 11 05 60, D-42655 Solingen Germany	OLC - EMEA (Europe, Middle East & Africa) Phone: +49 (0)212 2802 - 652 (OLC) +33 1 3083 1300 (English/German all segments incl. training)	
Online Services Ultrasound Asia Australia China India Japan Korea Singapore	 Phone: +(61) 1-800-647-855 +(86) 800-810-8188 +(91) 1800-425-8025 +(81) 42-648-2940 +(82) 2620 13585 +(95) 6277-3444	

1-5-2 System Manufacturer

Table 1-8 System Manufacturer

Manufacturer	Telephone	FAX
GE Healthcare Austria GmbH & Co OG Tiefenbach 15 A-4871 Zipf Austria	+43 (0) 7682-3800-0	+43 (0) 7682-3800-47

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Chapter 2
Site Preparation

Section 2-1
Overview

2-1-1 Purpose of Chapter 2

This chapter provides the information required to plan and prepare the installation of a Voluson® 730Pro/ProV ultrasound unit. Included are descriptions of the facility and electrical needs to be met by the purchaser of the unit.

Table 2-1 Contents in Chapter 2

Section	Description	Page Number
2-1	Overview	2-1
2-2	General Console Requirements	2-1
2-3	Facility Needs	2-5

Section 2-2
General Console Requirements

2-2-1 Environmental Requirements

Table 2-2 Environmental Requirements

Operating Temperature	Operating Humidity	Heat Dissipation	Storage Temperature	Storage Humidity
10 to 30°C (50 to 104°F)	30 to 80% rH non-condensing	3446 BTU pr hour	-10 to 40 °C (14 to 104°F)	< 90% rH non-condensing

CAUTION If the system has been in storage or has been transported, please see the acclimation requirements *before* powering ON and/or using the system (see: Section 3-2-2 "Installation Warnings" on page 3-2).

2-2-1-1 Cooling

The cooling requirement for the Voluson® 730Pro/ProV is 3446 BTU/hr. This figure does not include cooling needed for lights, people, or other equipment in the room.

NOTE: Each person in the room places an additional 300 BTU/hr. demand on the cooling system.

2-2-1-2 Lighting

Bright light is needed for system installation, updates and repairs. However, operator and patient comfort may be optimized if the room light is subdued and indirect. Therefore a combination lighting system (dim/bright) is recommended. Keep in mind that lighting controls and dimmers can be a source of EMI which could degrade image quality. These controls should be selected to minimize possible interference.

2-2-2 Electrical Requirements

NOTE: GE Medical Systems requires a dedicated power and ground for the proper operation of its Ultrasound equipment. This dedicated power shall originate at the last distribution panel before the system.

The dedicated line shall consist of one phase, a neutral (not shared with any other circuit), and a full size Ground wire from the distribution panel to the Ultrasound outlet.

NOTE: Please note that image artifacts can occur, if at any time within the facility, the Ground from the main facility's incoming power source to the Ultrasound unit is only a conduit.

2-2-2-1 Voluson® 730Pro/ProV Power Requirements

Table 2-3 Electrical Specifications for Voluson® 730Pro/ProV

Voltage	Tolerances	Current	Frequency
100 VAC	±10%	9,2 A	50, 60 Hz (±2%)
115 VAC	±10%	8.00 A	50, 60 Hz (±2%)
130 VAC	±10%	7.10 A	50, 60 Hz (±2%)
230 VAC	±10%	4.00 A	50, 60 Hz (±2%)
240 VAC	±10%	3,85 A	50, 60 Hz (±2%)

Power Consumption nominal 920 VA including all options.
Mains outlets: Mains socket ST1, ST2, ST3, ST4, ST5 for accessories.
All mains outlets are co-switched by the unit's mains switch via built-in isolation transformer.
Output voltage for: ST1 - ST5: 115V or 230V.

CAUTION **Modification of voltage setting only by an authorized service person!**
The maximum power consumption of equipment (inclusive color video monitor) connected to these outlets must not exceed 350VA!

2-2-2-2 Inrush Current

Inrush current isn't a factor to consider due to the inrush current limiting properties of the power supplies

2-2-2-3 Site Circuit Breaker

It is recommended that the branch circuit breaker for the machine be readily accessible.

CAUTION **POWER OUTAGE MAY OCCUR.**

The Voluson® 730Pro/ProV requires a dedicated single branch circuit. To avoid circuit overload and possible loss of critical care equipment, make sure you DO NOT have any other equipment operating on the same circuit.

2-2-2-4 Site Power Outlets

A dedicated AC power outlet must be within reach of the unit without extension cords. Other adequate outlets for the external peripherals, medical and test equipment needed to support this unit must also be present within 1 m (3.2 ft.) of the unit. Electrical installation must meet all current local, state, and national electrical codes.

2-2-2-5 Main Power Plug

The Voluson® 730Pro/ProV is supplied with a main power plug, as standard.
In the event that the unit arrives without a power plug, or with the wrong plug, contact your GE dealer. When necessary, the installation engineer will supply the appropriate power plug to meet the applicable local regulations.

2-2-3 EMI Limitations

Ultrasound machines are susceptible to Electromagnetic Interference (EMI) from radio frequencies, magnetic fields, and transients in the air or wiring. Ultrasound machines also generate EMI. The Voluson® 730Pro/ProV complies with limits as stated on the EMC label. However, there is no guarantee that interference will not occur in a particular installation.

NOTICE Possible EMI sources should be identified before the unit is installed.

Electrical and electronic equipment may produce EMI unintentionally as the result of a defect. These sources include:

- medical lasers
- scanners
- cauterizing guns
- computers
- monitors
- fans
- gel warmers
- microwave oven
- light dimmers
- portable phones
- broadcast stations and mobile broadcasting machines

Table 2-4 EMI Prevention/Abatement

EMI Rule	Details
Be aware of RF sources.	Keep the unit at least 5 meters (16.4 feet) away from other EMI sources. Special shielding may be required to eliminate interference problems caused by high frequency, high powered radio or video broadcast signals.
Ground the unit.	Poor grounding is the most likely reason a unit will have noisy images. Check grounding of the power cord and power outlet.
Replace and/or reassemble all screws, RF gaskets, covers and cores.	After you finish repairing or updating the system, replace all covers and tighten all screws. Any cable with an external connection requires a magnet wrap at each end. Install the shield over the front of card cage. Loose or missing covers or RF gaskets allow radio frequencies to interfere with the ultrasound signals.
Replace broken RF gaskets.	If more than 20% or a pair of the fingers on an RF gasket are broken, replace the gasket. Do not turn ON the unit until any loose metallic part is removed and replaced, if required.
Do not place labels where RF gaskets touch metal.	Never place a label where RF gaskets meet the unit. Otherwise, the gap created will permit RF leakage. In case a label has been found in such a location, move the label to a different, appropriate location.
Use GE- specified harnesses and peripherals.	The interconnect cables are grounded and require ferrite beads and other shielding. Cable length, material, and routing are all important; do not make any changes that do not meet all specifications.
Take care with cellular phones.	Cellular phones may transmit a 5 V/m signal that causes image artifacts.
Properly dress peripheral cables.	Do not allow cables to lie across the top of the card cage or hang out of the peripheral bays. Loop the excess length for peripheral cables inside the peripheral bays. Attach the monitor cables to the frame.

2-2-4 Probe Environmental Requirements

Operation: Ambient temperature 18° to 30° C

Storage: -10° to 50° C

NOTE: Temperature in degrees C. Conversion to degrees F = °C (9/5) + 32).

NOTICE **SYSTEMS AND ELECTRONIC PROBES ARE DESIGNED FOR STORAGE TEMPERATURES OF -10 TO + 50 degrees C. WHEN EXPOSED TO LARGE TEMPERATURE VARIATIONS, THE PRODUCT SHOULD BE KEPT IN ROOM TEMPERATURE FOR 10 HOURS BEFORE USE.**

2-2-5 Time and Manpower Requirements

Site preparation takes time. Begin Pre-installation checks as soon as possible. If possible, allow six weeks before delivery, for enough time to make necessary changes.

CAUTION **Have two people available to deliver and unpack the Voluson® 730Pro/ProV. Attempts to move the unit considerable distances or on an incline by one person alone, could result in injury or damage or both.**

2-2-6 System Specifications

2-2-6-1 Physical Dimensions of Voluson® 730Pro/ProV

The physical dimensions of the Voluson® 730Pro/ProV unit are summarized in Table 2-5. Table 2-6 lists the size of Voluson® 730Pro/ProV, with monitor and without on-board peripherals.

Table 2-5 Physical Dimensions of Voluson® 730Pro/ProV

Height	Width	Depth
142 cm / 55.9 inches	68 cm / 26.8 inches	100 cm / 39.4 inches

2-2-6-2 Weight without Monitor and Peripherals

Table 2-6 Weight of Voluson® 730Pro/ProV with Monitor and without other Peripherals

Model	Weight [kg]	Weight [lbs.]
Voluson® 730Pro/ProV	136	300

2-2-6-3 Acoustic Noise Output

max. 57dB(A)

2-2-6-4 Electrical Specifications

Please refer to Section 2-2-2-1 "Voluson® 730Pro/ProV Power Requirements" on page 2-2.

Section 2-3
Facility Needs

2-3-1 Purchaser Responsibilities

The work and materials needed to prepare the site is the responsibility of the purchaser. Delay, confusion, and waste of manpower can be avoided by completing pre installation work before delivery.

Use the Pre-installation checklist (provided in Table 2-7) to verify that all needed steps have been taken.

Table 2-7 Voluson® 730Pro/ProV Pre-Installation Check List

Action	Yes	No
Schedule at least 3 hours for installation of the system.		
Notify installation team of the existence of any variances from the basic installation.		
Make sure system and probes have been subject to acclimation period.		
Environmental cooling is sufficient.		
Lighting is adjustable to adapt to varying operational conditions of the scanner.		
Electrical facilities meet system requirements.		
EMI precautions have been taken and all possible sources of interference have been removed.		
Mandatory site requirements have been met.		
If a network is used, IP address has been set for the system and a dedicated network outlet is available.		

Purchaser responsibility includes:

- Procuring the materials required.
- Completing the preparations before delivery of the ultrasound system.
- Paying the costs for any alterations and modifications not specifically provided in the sales contract.

NOTE: All electrical installations that are preliminary to the positioning of the equipment at the site prepared for the equipment must be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations, and testing must also be performed by qualified personnel. The products involved (and the accompanying electrical installations) are highly sophisticated and special engineering competence is required. All electrical work on these products must comply with the requirements of applicable electrical codes. The purchaser of GE equipment must only utilize qualified personnel to perform electrical servicing on the equipment.

The desire to use a non–listed or customer provided product or to place an approved product further from the system than the interface kit allows presents challenges to the installation team. To avoid delays during installation, such variances should be made known to the individuals or group performing the installation at the earliest possible date (preferably prior to the purchase).

The ultrasound suite must be clean prior to delivery of the machine. Carpet is not recommended because it collects dust and creates static. Potential sources of EMI (electromagnetic interference) should also be investigated before delivery. Dirt, static, and EMI can negatively impact system reliability.

2-3-2 Mandatory Site Requirements

NOTE: GE Medical Systems requires a dedicated power and ground for the proper operation of its Ultrasound equipment. This dedicated power shall originate at the last distribution panel before the system. The dedicated line shall consist of one phase, a neutral (not shared with any other circuit), and a full size ground wire from the distribution panel to the Ultrasound outlet. Please note that image artifacts can occur, if at any time within the facility, the ground from the main facility's incoming power source to the Ultrasound unit is only a conduit.

The following are mandatory site requirements. Additional (optional) recommendations, as well as a recommended ultrasound room layout, are provided in Section 2-3-3 "Site Recommendations" .

- Door opening is at least 76 cm (30 in) wide.
- Proposed location for unit is at least 0.3 m (1 ft.) from the wall for cooling
- Clean and protected space for storage of probes (either in their case or on a rack).
- Material to safely clean probes (performed using a plastic container, never metal).
- Power outlet and place for any external peripheral are within 2 m (6.5 ft) of each other with peripheral within 1 m of the unit to connect cables.

NOTE: The Voluson® 730Pro/ProV has four outlets inside the unit. One is for the monitor and three for on board peripherals.

In case of network option:

- An active network outlet in the vicinity of the ultrasound unit.
- A network cable of appropriate length (regular Pin-to-Pin network cable).
- An IT administrator who will assist in configuring the unit to work with your local network. A fixed IP address is required. Refer to the form provided in Figure 3-89 on page 3-72 for network details that are required.

NOTE: All relevant preliminary network port installations at the prepared site must be performed by authorized contractors. The purchaser of GE equipment must utilize only qualified personnel to perform servicing of the equipment.

2-3-3 Site Recommendations

The following are (optional) site recommendations. Mandatory site requirements are provided in the *Mandatory Site Requirements* section, above.

- Door is at least 90 cm (3 ft.) wide
- Circuit breaker for dedicated power outlet is easily accessible
- Sink with hot and cold water
- Receptacle for bio–hazardous waste, like used probe sheaths
- Emergency oxygen supply
- Storage for linens and equipment
- Nearby waiting room, lavatory, and dressing room
- Dual level lighting (bright and dim)
- Lockable cabinet ordered by GE for its software and proprietary manuals

2-3-3-1 Recommended Ultrasound Room Layout

Figure 2-1 below shows a floor plan illustrating the recommended layout of the Ultrasound Room and depicting the minimal room layout requirements.

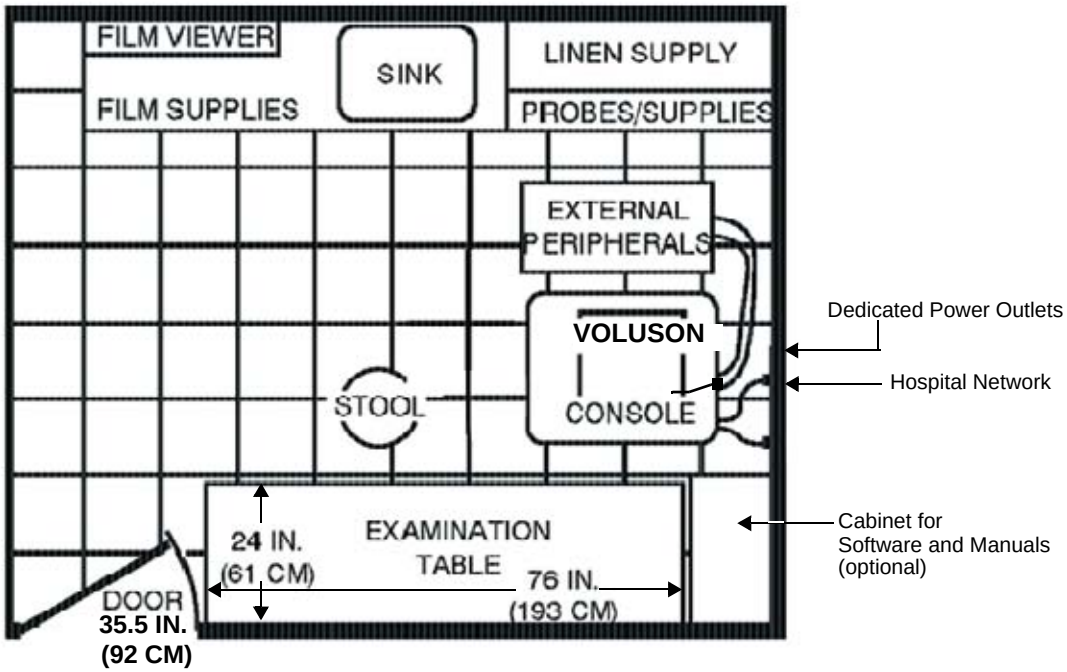


Figure 2-1 Recommended Floor Plan 4.3m x 5.2m (14ft x 17ft)

2-3-4 Networking Pre-installation Requirements

2-3-4-1 Purpose of the DICOM Network Function

DICOM (**D**igital **I**maging and **Co**mmunications in **M**edicine) services provide the operator with clinically useful features for moving images and patient information over a hospital network.
Examples of DICOM services include the transfer of images to workstations for viewing or transferring images to remote printers. As an added benefit, transferring images in this manner frees up the on-board monitor and peripherals, enabling viewing to be done while scanning continues.
With DICOM, images can be archived, stored, and retrieved faster, easier, and at a lower cost.

2-3-4-2 DICOM Option Pre-installation Requirements

To configure the Voluson® 730Pro/ProV to work with other network connections, the site's network administrator must provide some necessary information.

To configure the Voluson® 730Pro/ProV ultrasound unit to work with other network connections, the network administrator must provide some necessary information.

Use the Connectivity Setup Worksheet on page 3-71 to record required information that must include:

- **Voluson® 730Pro/ProV Details:** DICOM network details for the Voluson® 730Pro/ProV unit, incl. the host name, local port, IP address, AE title and net mask.
- **Routing Information:** IP addresses for the default gateway and other routers in use at the site.
- **DICOM Application Information:** Details of DICOM devices in use at the site, including DICOM host name, AE title, DICOM port number and IP addresses.

Installation see: Section 3-11 "Network IP Address Configuration" on page 3-69.

Chapter 3
Setup Instructions

Section 3-1
Overview

3-1-1 The Purpose of Chapter 3

This chapter contains information needed to setup the Voluson® 730Pro/ProV unit. Included are procedures to receive, unpack and configure the equipment. A worksheet is provided (see: page 3-71 to page 3-72) to help ensure that all the required information is available, prior to setup the system.

Table 3-1 Contents in Chapter 3

Section	Description	Page Number
3-1	Overview	3-1
3-2	Set Up Reminders	3-2
3-3	Receiving and Unpacking the Equipment	3-5
3-4	Preparing for Installation	3-7
3-5	Connection of Auxiliary Devices	3-9
3-6	Completing the Set Up	3-34
3-7	Printer Installation	3-38
3-8	System Configuration	3-60
3-9	Available Probes	3-68
3-10	Software/Option Configuration	3-68
3-11	Network IP Address Configuration	3-69
3-12	Connectivity Setup Worksheet	3-71
3-13	Paperwork	3-73

Section 3-2
Set Up Reminders

3-2-1 Average Installation Time

The Voluson® 730Pro/ProV installation and functional checkout will take approximately one hour; Voluson® 730Pro/ProV consoles with optional equipment may take slightly longer.

Once the site has been prepared, the average installation time require is shown in Table 3-2 below.

Table 3-2 Average Installation Time

Description	Average Installation Time	Comments
Unpacking the scanner	0.5 hours	
Scanner /options / printers	0.5 to 1.5 hours	Dependant on the required configuration
DICOM Option	0.5 - 1.5 hours	Dependant on the configuration amount

3-2-2 Installation Warnings

1.) Since the Voluson® 730Pro/ProV weighs approximately 136 kg (300 lb.) without options, two people are required to unpack it. Two people are required for installing any additional items in excess of 16kg / 35 pounds (e.g., Monitor).

2.) There are no operator serviceable components. To prevent shock, do not remove any covers or panels. Should problems or malfunctions occur, unplug the power cord.
Only qualified service personnel should carry out servicing and troubleshooting.

Moving/Lifting the System

When pulling, moving or lifting the system, grasp it only at the rear handle of the trolley and the handle underneath the foot rest.

Move the system forward or backward when going up or down incline.
Do not move the system sideways or diagonally.

WARNING
Do **NOT** pull or lift the system with the front handle of the user interface (operator panel).

Figure 3-1 moving or lifting the system

3-2-2-1 System Acclimation Time

After being transported, the Voluson® 730Pro/ProV system may be very cold or hot.
It requires one hour for each 2.5°C increment it's temperature is below 10°C or above 40°C.

CAUTION **Equipment damage possibility. Turning the system on without acclimation after arriving at site may cause the system to be damaged.**

Table 3-3 Acclimation Time

°C	60	55	50	45	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40
°F	140	131	122	113	104	96	86	77	68	59	50	41	32	23	14	5	-4	-13	-22	-31	-40
hrs	8	6	4	2	0	0	0	0	0	0	0	2	4	6	8	10	12	14	16	18	20

3-2-2-2 Control Panel Position

If weight is placed on the Operator I/O Panel in it's extended position the console could tip over.

WARNING ***The system should NOT be moved with the Control Panel (UI) extended. Move the Control Panel to it's centered and locked position. Refer to Section 6-4 on page 5.***

WARNING ***Monitor mounting mechanism may break if not properly supported (e.g., with packing foam) during transportation.***

3-2-2-3 Brake Pedal Operation

WARNING ***REMEMBER: If the front wheels are engaged for transportation, pressing the release brake pedals (brakes on front wheels under the foot rest) once disengages the lock.***

3-2-3 Safety Reminders

DANGER **WHEN USING ANY TEST INSTRUMENT THAT IS CAPABLE OF OPENING THE AC GROUND LINE (I.E., METER'S GROUND SWITCH IS OPEN), DON'T TOUCH THE UNIT!**

CAUTION **Two people should unpack the unit because of its weight.**
Two people are required whenever a part weighing 16kg (35 lb.) or more must be lifted.

CAUTION **If the unit is very cold or hot, do NOT turn on its power until it has had sufficient time to acclimate to its operating environment.**

CAUTION **To prevent electrical shock, connect the unit to a properly grounded power outlet. Do not use a three to two prong adapter. This defeats safety grounding.**

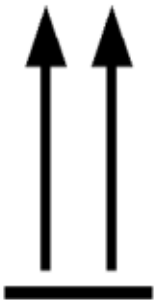
CAUTION **Do NOT wear the ESD wrist strap when you work on live circuits and more than 30 V peak is present.**

CAUTION **Do not use a 20 Amp to 15 Amp adapter on the 120 Vac unit's power cord.**
This unit requires a dedicated 16 A circuit.

CAUTION **DO NOT operate this unit unless all board covers and frame panels are securely in place, to ensure optimal system performance and cooling.**
(When covers are removed, EMI may be present).

CAUTION **OPERATOR MANUAL(S)**
The User Manual(s) should be fully read and understood before operating the Voluson® 730Pro/ProV and kept near the unit for quick reference.

CAUTION **ACOUSTIC OUTPUT HAZARD**
Although the ultrasound energy transmitted from the Voluson® 730Pro/ProV probe is within FDA limits, avoid unnecessary exposure. Ultrasound energy can produce heat and mechanical damage.



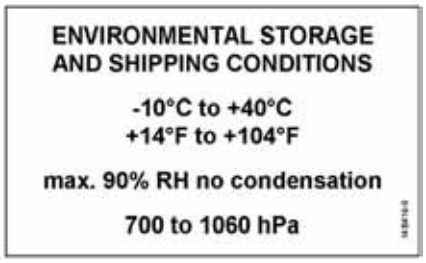


Figure 3-2 Environmental Labels

Section 3-3
Receiving and Unpacking the Equipment

CAUTION

Transport only with forklift or stracker truck.
During transport pay attention to the point of gravity (“tilt and drop” indicator)!

Have two people available to unpack the Voluson® 730Pro/ProV.
Attempts to move the unit considerable distances or on an incline by one person could result in injury or damage or both.

The envelope with delivery address, packing list and invoice is located on the front panel of the crate.

Check whether delivery is complete (according to packing list) and check visual damage!

Figure 3-3 envelope at front panel of the crate

NOTICE **The device must only be transported in the original packaging!**

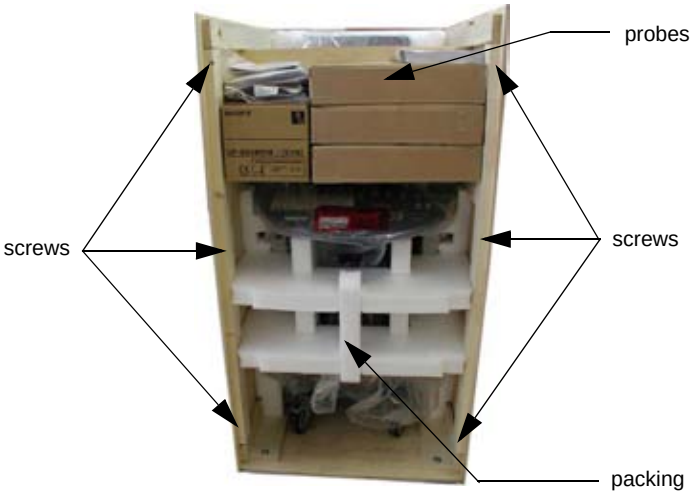
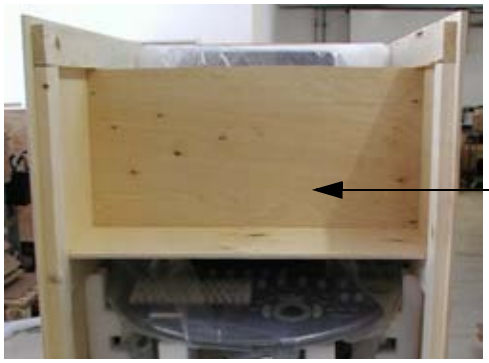
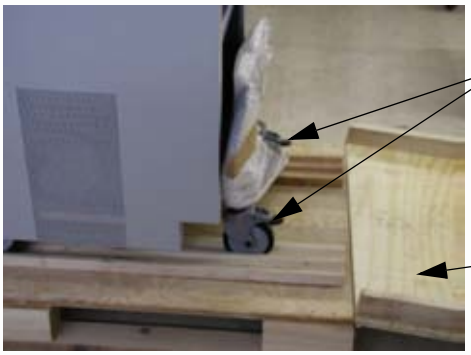
Unpack the devices such a way that packaging can be reused.

A drill with size 20 torx bit and/or a Phillips 2 screwdriver is needed to open the crate.

Table 3-4 Unpacking Procedure

Step	Task
1.	Loosen the screws and remove top panel from crate; top panel is used for the ramp.

Table 3-4 Unpacking Procedure

Step	Task
2.	Open front panel by removing the screws from the side panels. Remove probes and accessories from the wooden box.  **WARNING** ***Do not open side panels prior to removing the front panel! Accessories could drop down and DAMAGE the user interface!***
3.	Loosen all screws to remove the wooden rack for accessories as well as the left, right and back panel. 
4.	Carefully remove foam packing material and plastic bag from the ultrasound unit and monitor.
Caution: Two people are needed in the next step due to the weight of the equipment.	
5.	Disengage the brakes and slowly move unit down the ramp (top panel). 
Note: Packing crate and material should be stored for future use.	

Section 3-4
Preparing for Installation

3-4-1 Verify Customer Order

1.) After unpacking the equipment, it is important to verify that all items ordered by the customer have been received. Compare all items listed on the packing slip (delivery note) with those received.

NOTICE It is recommended to keep and store the shipping carton and all other packing materials (including the support foams, anti-static plastic cover, etc.), in case the unit has to be moved to a different location. Unpack the devices such a way that packaging can be reused.
For warranty purposes, storage of the above is required for one year from date of purchase.

2.) Visually inspect the system components using the following checklist.

Table 3-5 Damage Inspection Checklist - Voluson® 730Pro/ProV System

✔	Step	Item	Recommended Procedure
	1	Main label	Enter **Serial Number:** _____ (printed on main label on back of the system)
	2	Console	Verify that the system is switched OFF and unplugged. Clean the console and control panel.
	3	Control Console	Physically inspect the control console for missing or damaged items. After switching on the system, verify the proper illumination of all the control panel buttons.
	4	Probes	Check all probes for wear and tear on the lens, cable, and connector. Look for bent or damaged pins on the connector and in the connector socket on the unit. Verify that the EMI fingers around the probe connector socket housing are intact. Check the probe locking mechanism and probe switch.
	5	LCD Display	Clean the LCD display by gently wiping with a dry, soft, lint-free non-abrasive folded cloth. Inspect the monitor for scratches and raster burn.
	6	Fans	Verify that the system's cooling fans and peripheral fans are operating.
	7	Rear Panel	Check the rear panel connectors for bent pins, loose connections and loose or missing hardware. Screw all the cable connectors tightly to the connector sockets on the panel. Verify that the labeling is in good condition.
	8	Covers	Check that all screws are tightly secured in place, that there are no dents or scratches and that no internal parts are exposed.
	9	Peripherals	Check and clean the peripherals in accordance with the manufacturer's directions. To prevent EMI or system overheating, dress the peripheral cables inside the peripheral cover.
	10	Power Cord	Check the power cord for cuts, loose hardware, tire marks, exposed insulation, or any deterioration. Verify continuity. Replace the power cord, as required.
	11	System Voltage setting	Verify that the Voluson® 730Pro/ProV is set to the correct voltage. see: Section 3-4-2 "System Voltage Settings" on page 3-8

NOTE: Report any items that are missing, back-ordered, or damaged, to your GE Healthcare sales representative. The contact address is shown in Contact Information on page 1-15.

3-4-2 System Voltage Settings

Verify that the scanner is set to the correct voltage. The Voltage settings for the Voluson® 730Pro/ProV Scanner is found on the identification plate, on the rear of the system.

Figure 3-4 Identification Plate

⚠ **WARNING** ***CONNECTING A Voluson® 730Pro/ProV SCANNER TO THE WRONG VOLTAGE LEVEL WILL MOST LIKELY DESTROY THE SCANNER.***

3-4-3 EMI Protection

This unit has been designed to minimize the effects of Electo-Magnetic Interference (EMI). Many of the covers, shields, and screws are provided primarily to protect the system from image artifacts caused by this interference. For this reason, it is imperative that all covers and hardware are installed and secured before the unit is put into operation.

Ensure that the system is protected from electromagnetic interference (EMI), as follows:

- Operate the system at least 15 feet away from equipment that emits strong electromagnetic radiation.
- Operate the system in an area enclosed by walls, floors and ceilings comprised of wood, plaster or concrete, which help prevent EMI.
- Shield the system when operating it in the vicinity of radio broadcast equipment, if necessary.
- Do not operate mobile phones or other EMI emitting devices in the ultrasound room.
- Verify that all EMI rules listed in the following table are followed:

The Voluson® 730Pro/ProV ultrasound unit is approved for use in hospitals, clinics and other environmentally qualified facilities, in terms of the prevention of radio wave interference. Operation of the ultrasound unit in an inappropriate environment can cause electronic interference to radios and television sets situated near the medical equipment.
For further details and EMI Prevention/Abatement refer to Section 2-2-3 "EMI Limitations" on page 2-3.

Section 3-5
Connection of Auxiliary Devices

3-5-1 Preparations

NOTE: ***Normally the auxiliary devices and peripherals come already installed with the system.***

1.) Carefully remove plastic caps using a knife and loosen screws and washers. (see: Figure 3-5)
2.) When the cover is loose on top, pull the rear cover out and move it upwards.

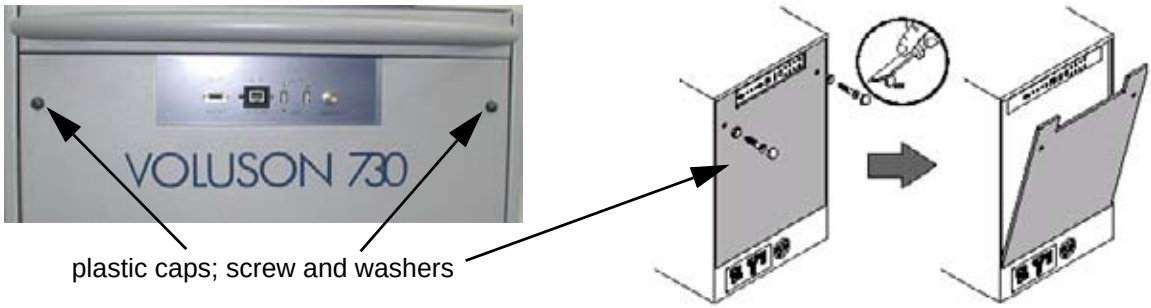


Figure 3-5 Remove rear cover plate

3.) Disconnect the GND ground cable from the back of rear cover plate.

Figure 3-6 GND ground cable

4.) Connect Peripherals according to correct connection scheme described in the following sub-sections (refer to Table 3-6 on page 3-10).
5.) Connect the ground cable at the rear cover plate.
6.) Mount rear cover plate, reattach screw and washers and plug-in the caps.

3-5-1 Preparations (cont'd)

Table 3-6 below outlines Voluson® 730Pro/ProV hardware installation procedures described in the sub-sections.

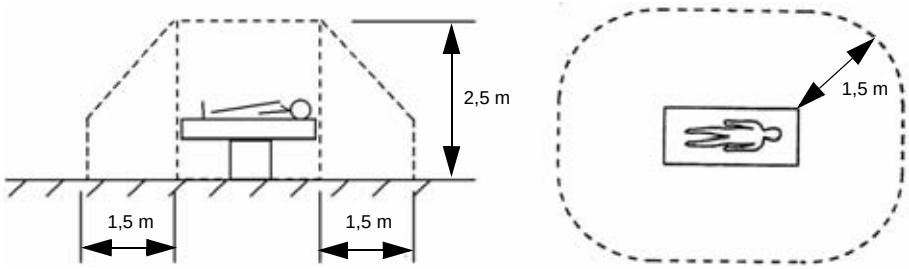
Table 3-6 Connection Procedures

Sub-section	Description	Page Number
3-5-2	Monitor Connection	3-11
3-5-3	Foot Switch Connection	3-11
3-5-4	ECG-preamplifier Connection	3-11
3-5-5	Global Modem Connection	3-12
3-5-6	S-VHS Video Recorder Connection	3-13
3-5-7	DVD Recorder (DVR) Connection	3-15
3-5-8	B/W Video Printer Connection	3-19
3-5-9	Line Printer Connection	3-21
3-5-10	Digital Color Printer Connection	3-22
3-5-11	Bluetooth Printer Connection	3-23
3-5-12	Worldwide 19'' secondary "Patient" Monitor kit	3-25
3-5-13	External USB-Devices	3-32

WARNING ***DO NOT attempt to use different peripherals and accessories other than approved and provided by GE Healthcare!***
Any unauthorized peripherals may cause system failure or damage!

WARNING ***After each installation, the leakage currents have to be measured according to IEC 60601-1 respectively UL 60601-1.***

CAUTION **Please observe that some printers may not be medical devices! If the Bluetooth Printer and/or Line Printers are not medical devices, they have to be located outside of the patient environment (according to IEC 60601-1 / UL 60601-1).**



NOTE: For more detailed Safety Considerations when connecting auxiliary devices to the Voluson® 730Pro/ProV system, please review: Chapter 1 - Auxiliary Devices Safety.

3-5-2 Monitor Connection

NOTE: The monitor comes already installed with the system.

3-5-3 Foot Switch Connection

Figure 3-7 Foot Switch Connection Scheme

NOTE: After physical connection, adjust the Footswitch (Left/Right) as described in *Section 3-7-7 "Remote Control Selection" on page 3-59**.*

3-5-4 ECG-preamplifier Connection

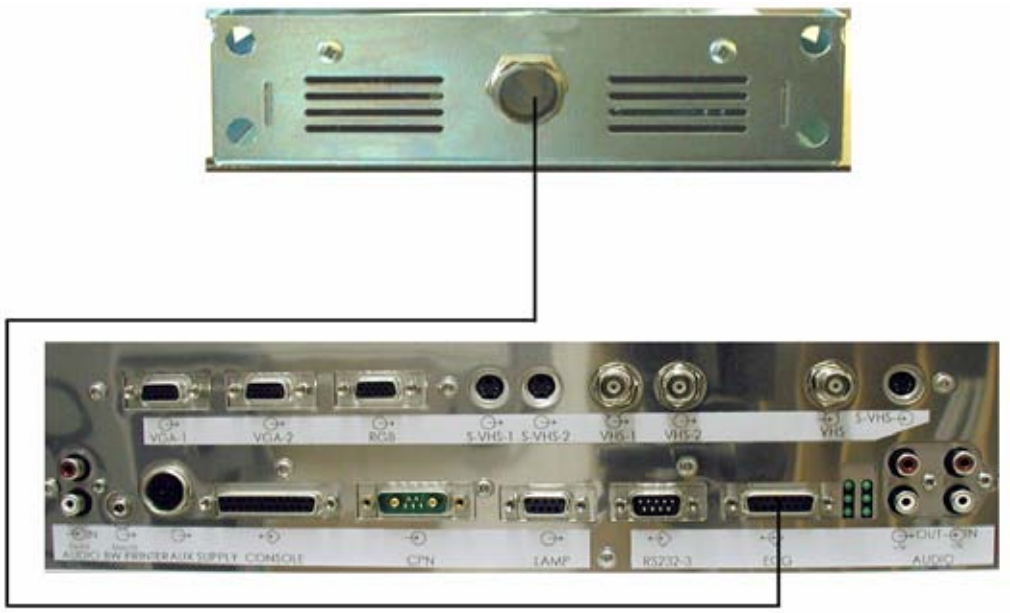


Figure 3-8 ECG Connection Scheme

3-5-5 Global Modem Connection

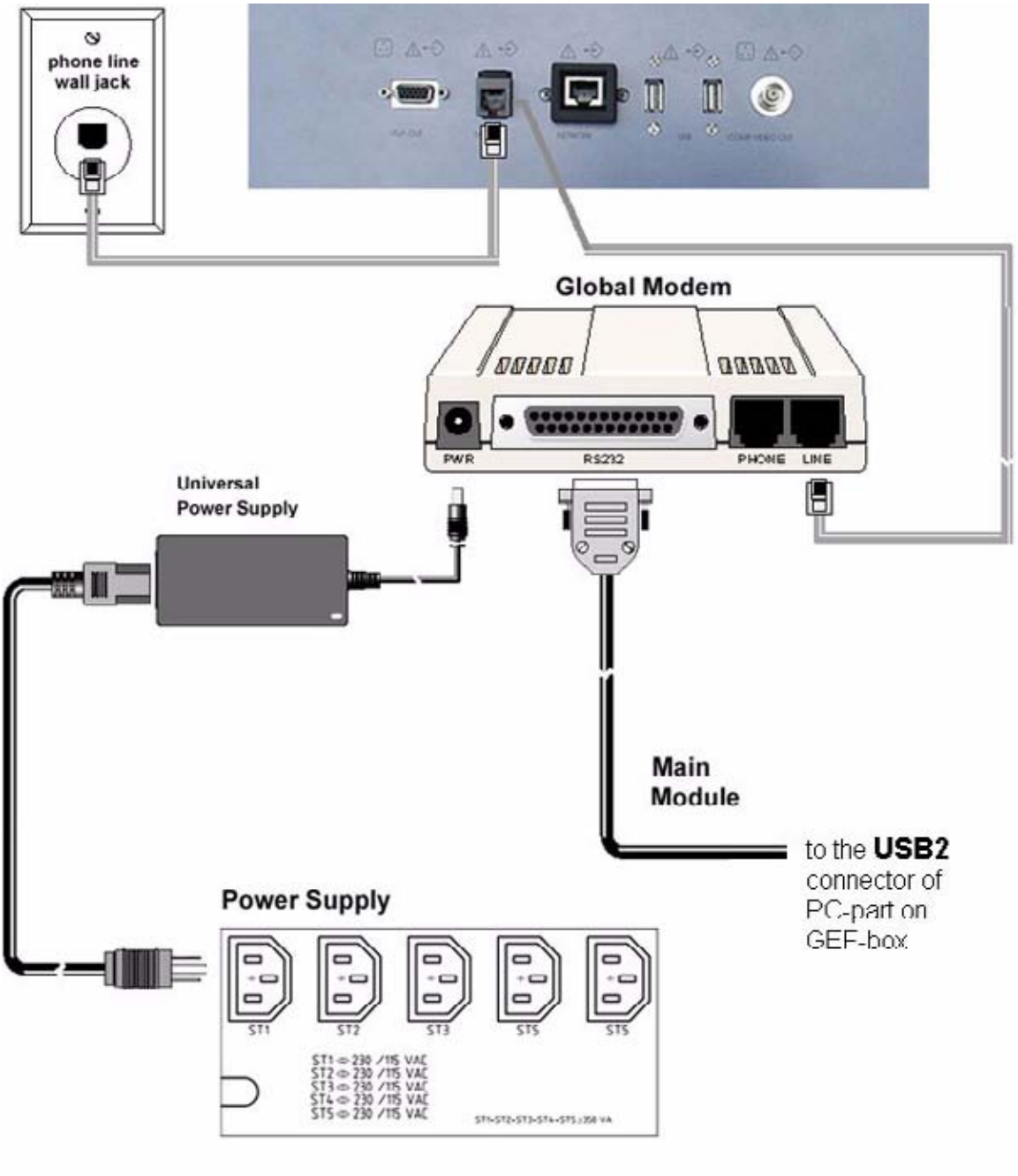


Figure 3-9 Global Modem Connection Scheme

⚠ **WARNING** ***Never install the telephone wiring, or use the modem during an electric storm; there may be a remote risk of electrical shock from lightning.***

⚠ **CAUTION** **Use only the power adapter supplied with the modem and connect it as shown. Use of any other power adapter will void the warranty and could damage the modem.**

3-5-6 S-VHS Video Recorder Connection

NOTE: Please refer to connection scheme belonging to the used VCR type:
- *Section 3-5-6-1 "Mitsubishi HS-MD3000" on page 3-13*
- *Section 3-5-6-2 "Sony SVO-9500MD" on page 3-14*

3-5-6-1 Mitsubishi HS-MD3000

NOTE: There are two types of Mitsubishi HS-MD3000 VCR (PAL and NTSC) approved by GE Healthcare. Use the standard VCR type (PAL or NTSC) that is suited to your region.

CAUTION **ONLY the specific GE - Kretztechnik Version of this video recorder type may be used in connection with the system!**

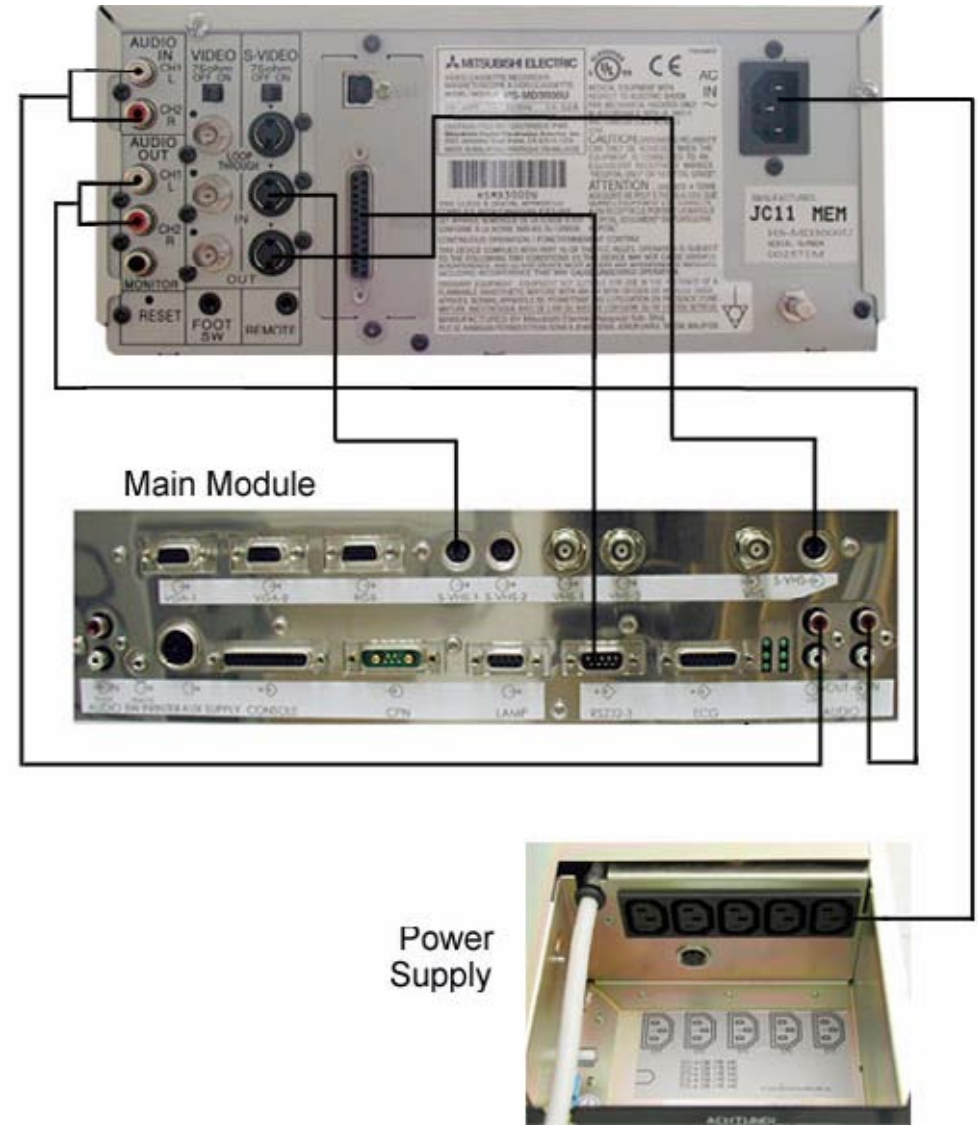


Figure 3-10 Mitsubishi - Video Recorder Connection Scheme

NOTICE Please use the proper connection set and remote cable.
see: Section 9-12 "Optional Peripherals and Accessories" on page 9-26.

3-5-6-2 Sony SVO-9500MD

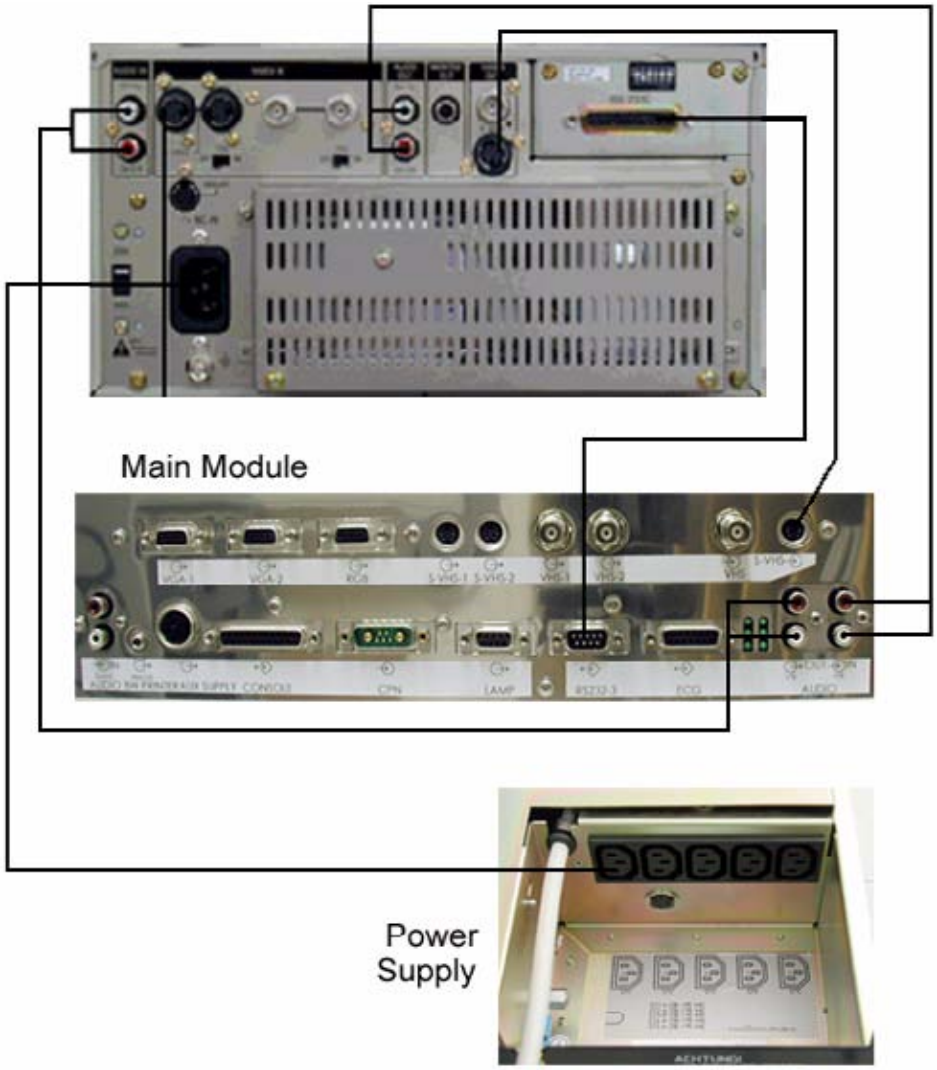
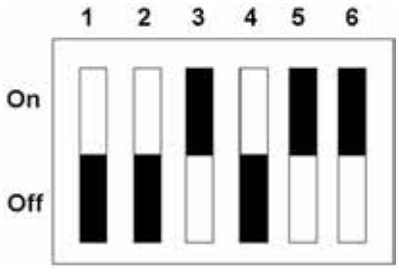


Figure 3-11 Video Recorder Connection Scheme



Set DIP Switches on back of the VCR as shown:

Switch 1:	OFF-Audio is muted during fast playback
Switch 2:	OFF-FF/REW mode is used during searches.
Switch 3:	ON-VCR counter is reset upon cassette ejection.
Switch 4:	OFF-The VCR can be controlled by the system.
Switch 5 + 6:	ON-The Baud rate is set to 19200 bit/sec (must be the same as Voluson® 730Pro/ProV)

Figure 3-12 DIP Switches

NOTICE Please use the proper connection set and remote cable.
see: Section 9-12 "Optional Peripherals and Accessories" on page 9-26.

3-5-7 DVD Recorder (DVR) Connection

NOTICE Regardless of what other peripherals are installed, the DVD Recorder needs to be put on the lower shelf for easy access to the DVD tray.

NOTICE The Sony DVO-1000MD DVD recorder is **only** able to read and write on DVD**+RW** (ReWriteable) media! Please check on your DVD case before using.

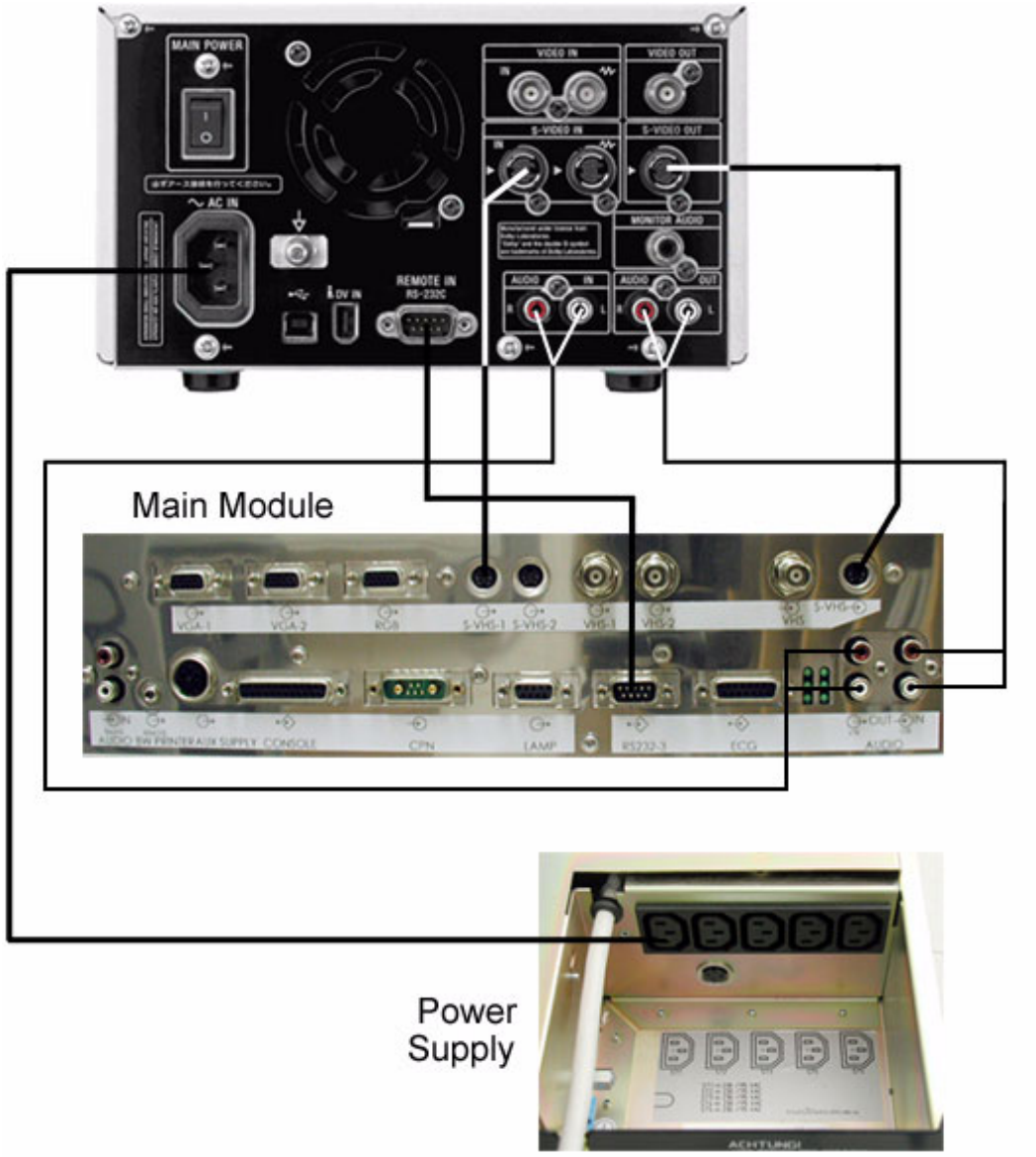


Figure 3-13 DVD Recorder - Connection Scheme

When all power and signal cables are connected to the system and DVD recorder, proceed as follows:

- Adjust the DVD Recorder settings as described in Section 3-5-7-1 on page 3-16.
- Check and if necessary change the Video Norm, see: Section 3-8-1-6 on page 3-63.
- Check and if necessary change the Record Type + VCR Source, see: Section 3-7-7 on page 3-59.

3-5-7-1 Adjustment of the DVD Recorder Settings

3-5-7-1-1 Changing TV System (Video Format)

NOTE: To check Video format needed, see: Table 3-7, "TV-System and Region Code," on page 3-18.

1.) If not already done, switch ON the Sony DVO-1000MD DVD recorder.
2.) Turn ON the power of the Voluson® 730Pro/ProV system.
3.) Press the **MENU** button **(A)** located on the front of the DVD recorder see Figure 3-14 below.

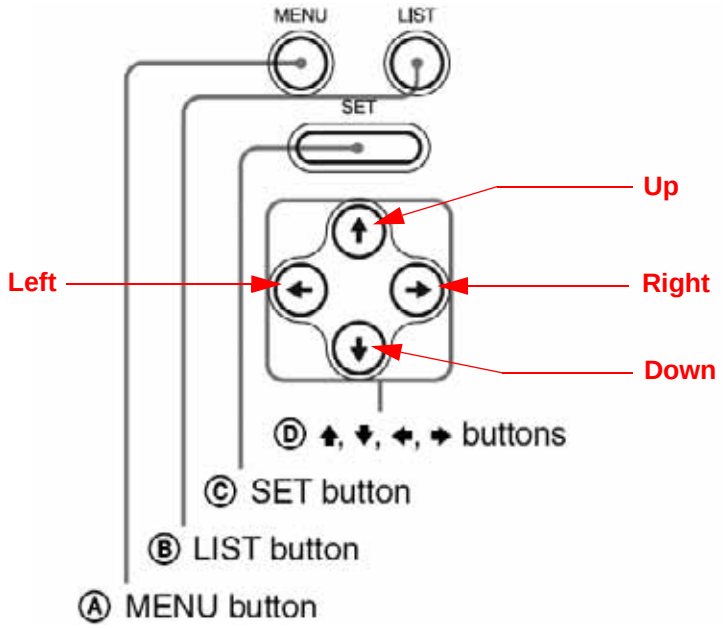


Figure 3-14 Keys on the front of the recorder

4.) The "Main Menu" appears on the LCD screen of the DVD recorder, see: Figure 3-15 below.

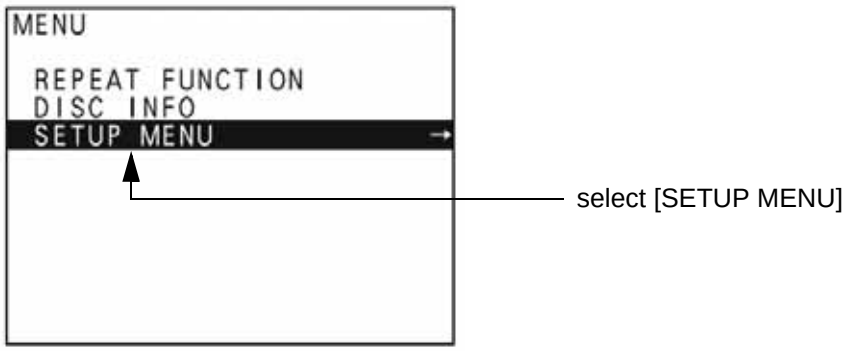


Figure 3-15 "Main Menu" - [SETUP MENU] highlighted

5.) Press the ↓ (down) button on the front of the recorder repeatedly until the [SETUP MENU] item is highlighted.

NOTE: Each time you press the ↑ (up) or ↓ (down) button, the highlight cursor moves up/down item by item.

6.) Press the → (right) button. The "Setup Menu" appears, see Figure 3-16 on page 3-17.

3-5-7-1-1 Changing TV System (Video Format) (cont'd)

7.) Press the ↓ (down) button repeatedly, until [MENU GRADE] is highlighted.

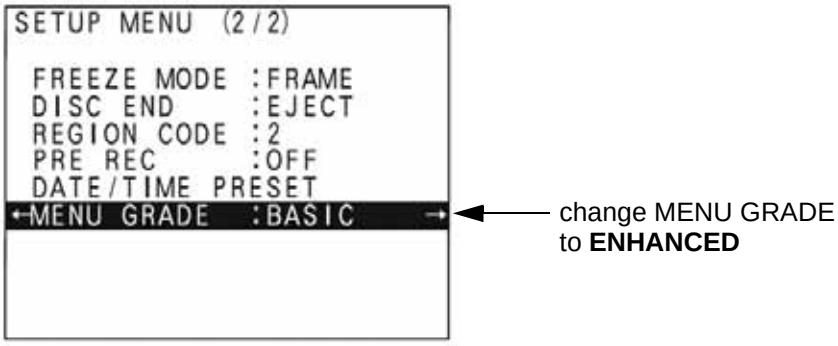


Figure 3-16 "Setup Menu" - [MENU GRADE] highlighted

8.) Press the → (right) button and select [ENHANCED].

9.) Press the ← (left) button, to exit the "Menu Grade" menu.

NOTE: Now additional items (see: Figure 3-17 on page 3-17) are displayed in the "Setup Menu".

10.) Select [TV SYSTEM] by pressing the ↓ (down) button.

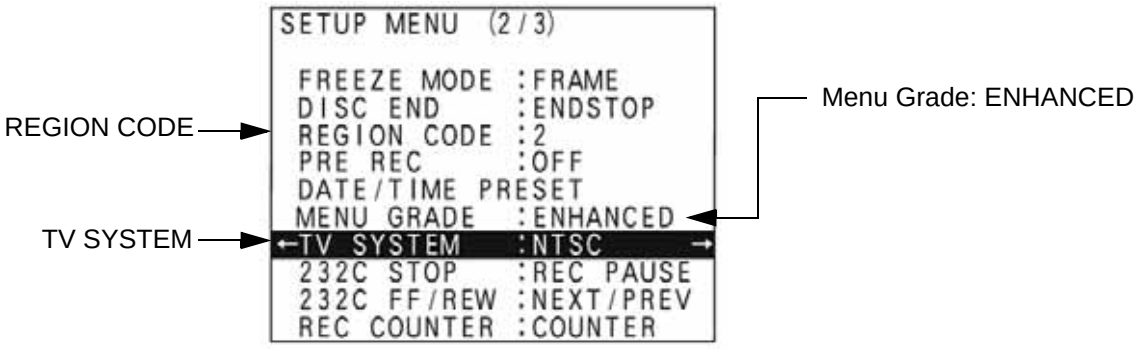


Figure 3-17 "Setup Menu" - [TV SYSTEM] highlighted

11.) Press the → (right) button. The "TV System" Sub menu appears.

12.) Select the appropriate video signal by pressing the ↑ (up) or ↓ (down) button respectively. To check the video signal, see: Table 3-7, "TV-System and Region Code," on page 3-18.

13.) Press the **SET** button **(C)**.
The message *"Now loading..."* appears and the unit starts to save the settings.

14.) When *"Power off"* appears on the display, press the **POWER** switch on the front of the DVD recorder to turn power off.

15.) Press the **POWER** switch again to turn power on.

3-5-7-1-2 Change the Region Code

NOTE: To specify the correct region code, see: Table 3-7, "TV-System and Region Code," on page 3-18.

1.) If not already done, switch on the Sony DVO-1000MD DVD recorder.
2.) Press the **MENU** button **(A)** located on the front of the DVR, see: Figure 3-14 on page 3-16.
3.) The "Main Menu" appears on the LCD screen of the DVD recorder, see: Figure 3-18 below.

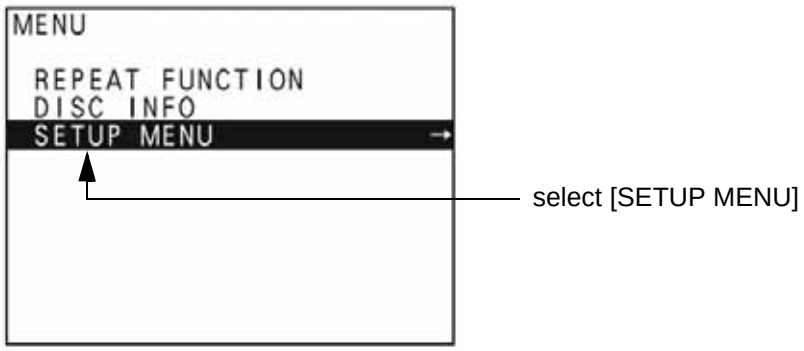


Figure 3-18 "Main Menu" - [SETUP MENU] highlighted

4.) Press the ↧ (down) button on the front of the recorder repeatedly until the [SETUP MENU] item is highlighted.
5.) Press the → (right) button. The "Setup Menu" appears, see Figure 3-17 on page 3-17.
6.) Press the ↧ (down) button repeatedly, until [REGION CODE] is highlighted.
7.) Press the → (right) button. The "Region Code Menu" appears.
8.) Select the appropriate region code by pressing the ↥ (up) or ↧ (down) button respectively. To check the region code, see: Table 3-7, "TV-System and Region Code," on page 3-18.
9.) Press the **SET** button **(C)**.
The message *"Now loading..."* appears and the unit starts to save the settings.
10.) When *"Power off"* appears on the display, press the **POWER** switch on the front of the DVD recorder to turn power off.
11.) Press the **POWER** switch again to turn power on.

Table 3-7 TV-System and Region Code

Country	Region Code	TV-System
USA and Canada	1	NTSC
Western Europe, Middle East, South Africa	2	PAL
Japan	2	NTSC
Southeast Asia, incl. Hong Kong	3	PAL/NTSC
Central and South America, Australia	4	PAL
Africa	5	NTSC
Eastern Europe, Russia, Central Asia incl. India	5	PAL
China	6	PAL

3-5-8 B/W Video Printer Connection

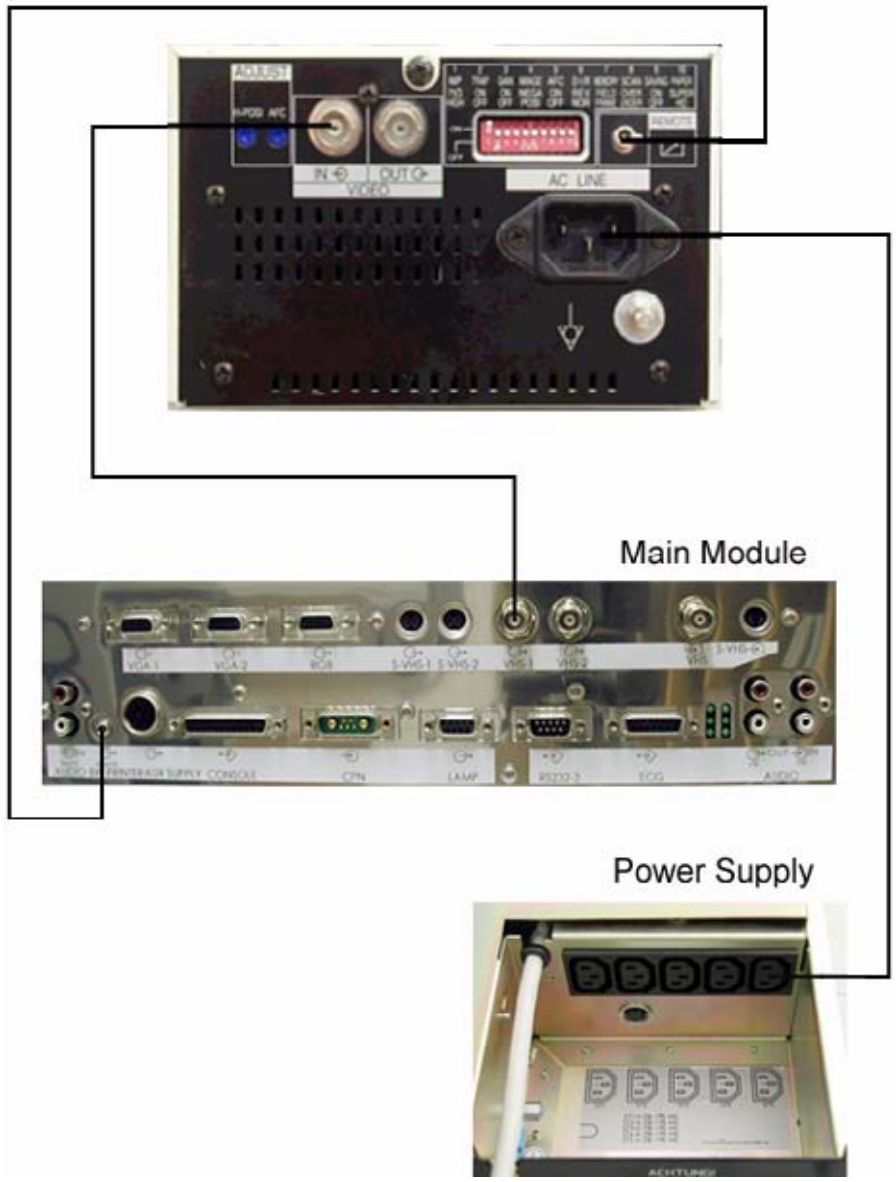
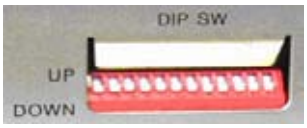


Figure 3-19 B/W Video Printer (Sony UP-895MD) - Connection Scheme



Set DIP Switches on back of the Black/White printer as shown in the image (all DOWN).

NOTICE Please use the proper connection set.
see: Section 9-12 "Optional Peripherals and Accessories" on page 9-26.

3-5-8-1 Sony UP-D897 (digital)

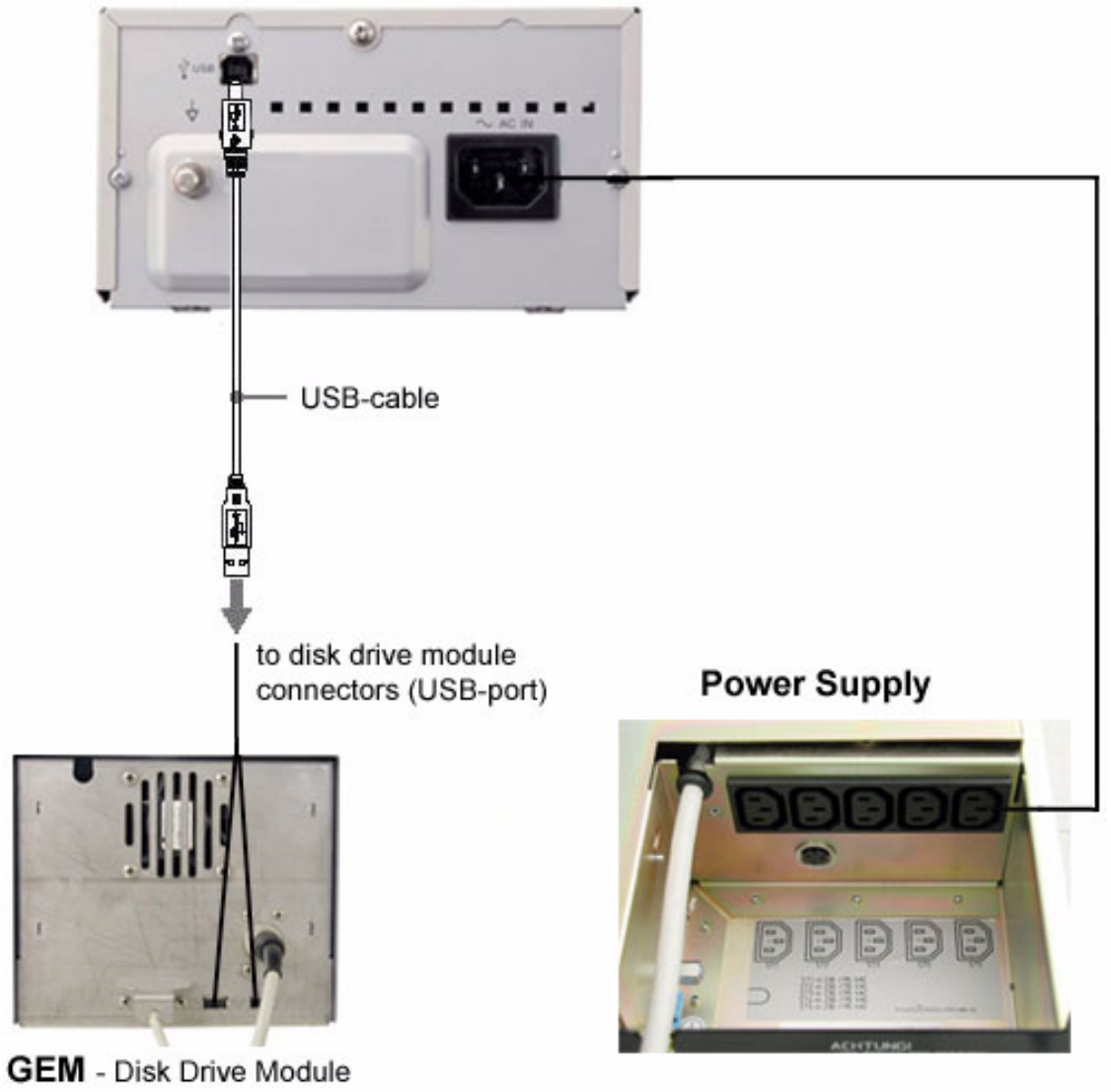


Figure 3-20 B/W Video Printer (Sony UP-D897) - Connection Scheme

⚠ **NOTICE** The switch of the printer has to be in ON position before starting the system.
Leave printer switch always in the ON position.

NOTE: For further installation instructions see:
Section 3-7-3 "Installing Digital Black & White Printer Sony UP-D897" on page 3-43.

3-5-9 Line Printer Connection

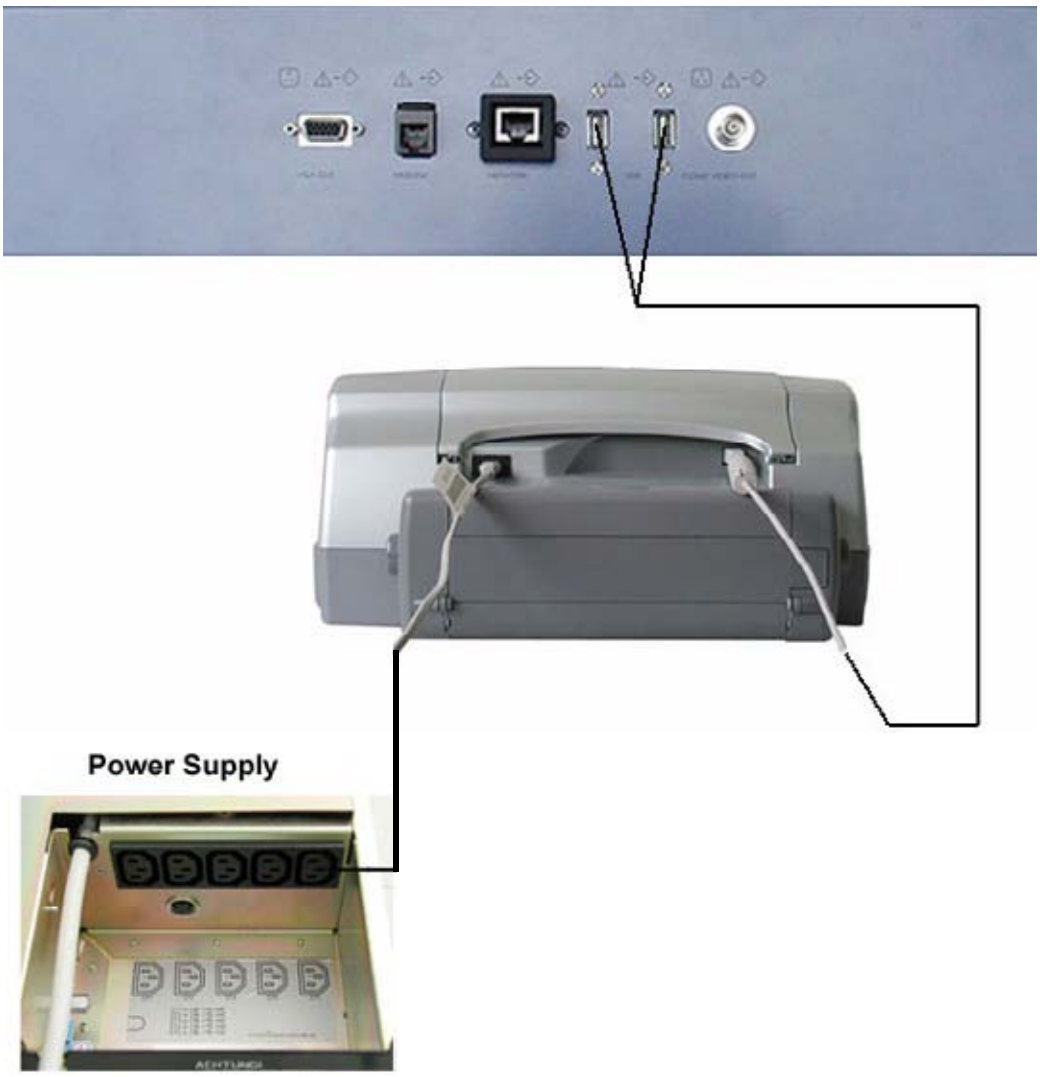


Figure 3-21 Line Printer Connection Scheme

CAUTION **Please observe that the Line Printer (HP 990cxi or HP 995c) has to be located outside of the patient environment (acc. IEC 60601-1 / UL 2601-1).**

NOTICE The switch of the printer has to be in ON position before starting the system.
Leave printer switch always in the ON position.

NOTICE Please use the proper connection set.

NOTE: For further installation instructions see:
Section 3-7-1 "Installing Line Printer HP 990cxi or HP 995c" on page 3-39.

3-5-10 Digital Color Printer Connection

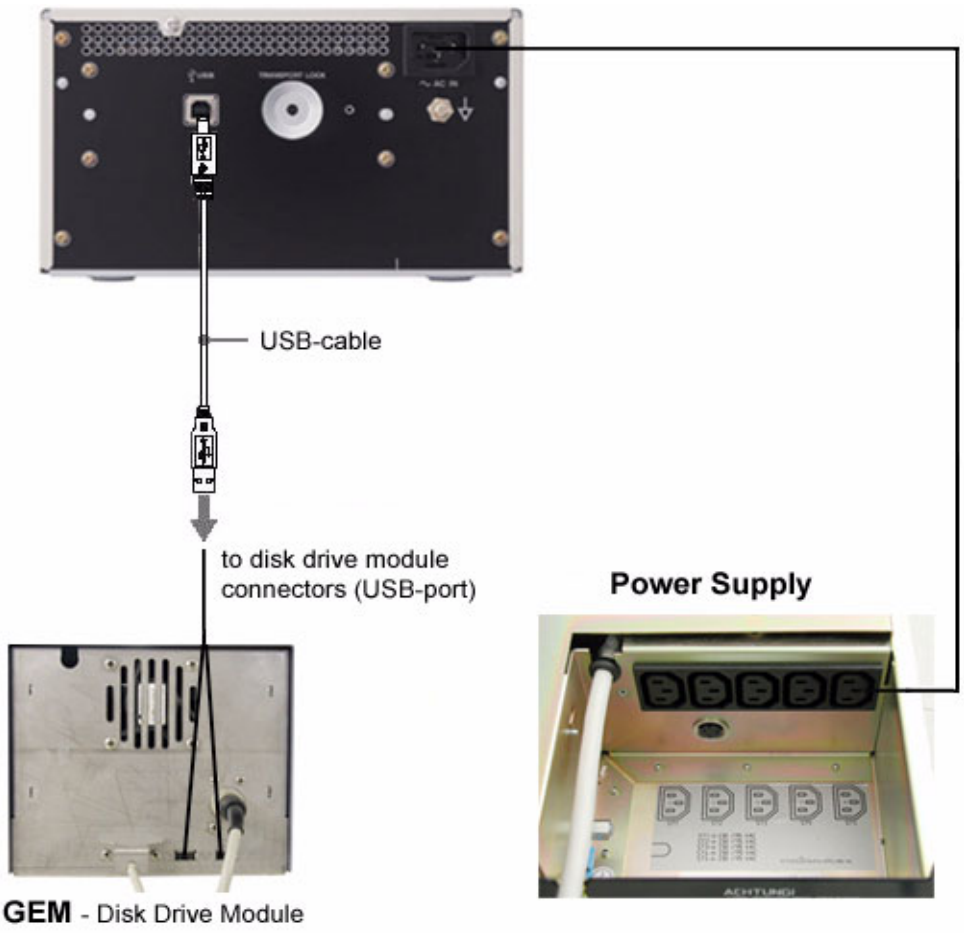


Figure 3-22 Digital Color Printer Connection Scheme

CAUTION **Pay attention to lateral distances. See Instruction Manual of the printer!**

CAUTION **The Printer Supply Voltage must be the same as the Output Voltage of the Voluson® 730Pro/ProV Power Out Connectors (Power Supply)!**

NOTICE The switch of the printer has to be in ON position before starting the system. Leave printer switch always in the ON position.

NOTICE Please use the proper connection set.
see: Section 9-12 "Optional Peripherals and Accessories" on page 9-26.

CAUTION **The Sony UP-D23MD printer must never be connected to USB-ports on the SBC backplane. Please use one of the two outlets on the back of the GEM (Disk Drive Module) only.**

NOTE: *For further installation instructions see:*
Section 3-7-2 "Installing Digital Color Printer Sony UP-D23MD or UP-D25MD" on page 3-41.

3-5-11 Bluetooth Printer Connection

NOTE: Please refer to connection scheme belonging to the used B/W Printer type:
- *Section 3-5-11-1 "HP 5600/5900 Series" on page 3-23*
- *Section 3-5-11-2 "Canon Pixma MP600/MP610" on page 3-24*

3-5-11-1 HP 5600/5900 Series

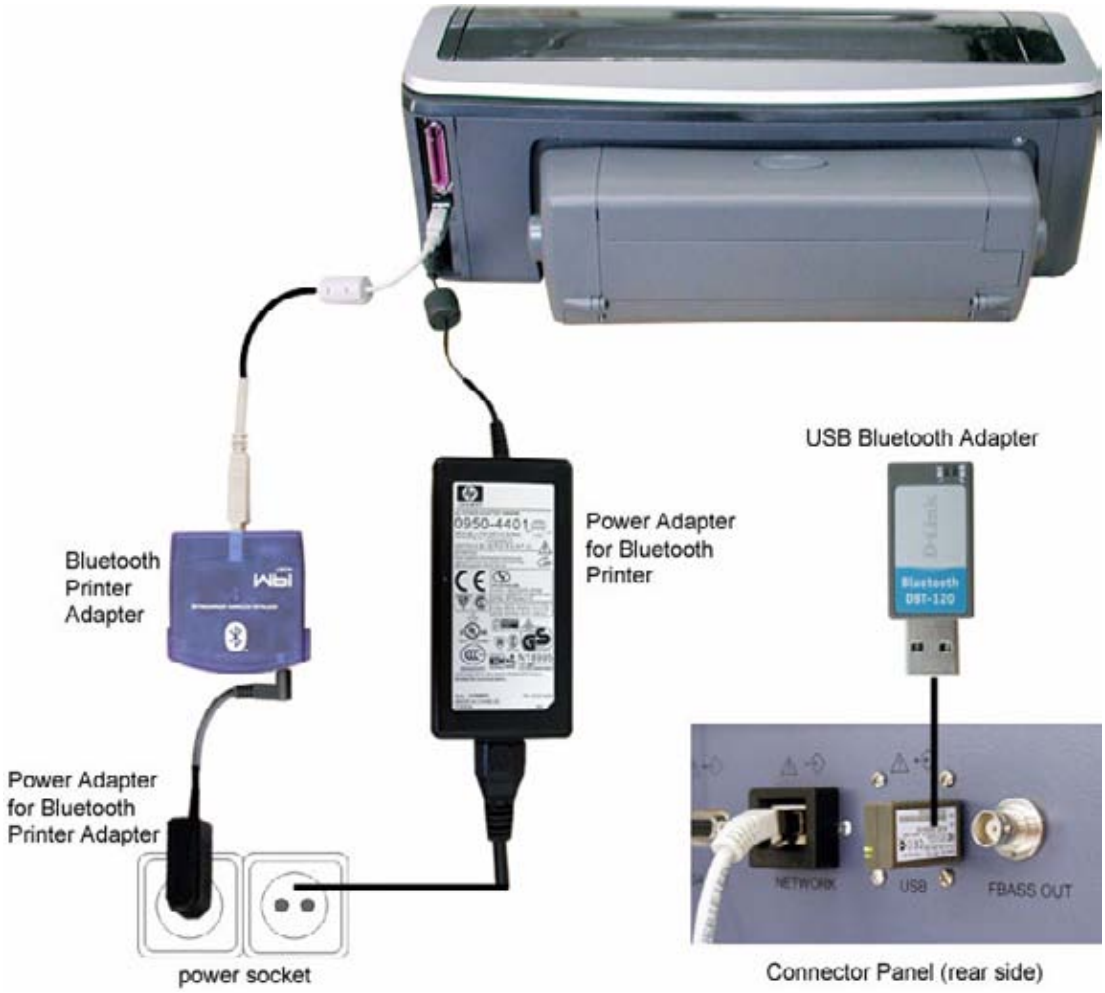


Figure 3-23 HP Bluetooth Printer - Connection Scheme

CAUTION **Please observe that the complete Bluetooth Printer Assembly has to be located outside of the patient environment (acc. IEC 60601-1 / UL 60601-1).**

CAUTION **The printer being used may not be a medical device. The Bluetooth Printer Set and the Power Supply of the Bluetooth Printer Adapter is also not a medical device.**
The equipment meets the requirements of the EN60950 Standard.

NOTICE The switch of the printer has to be in ON position before starting the system.
Leave printer switch always in the ON position.

NOTICE Please use the proper Bluetooth Printer Connection set.
see: Section 9-12 "Optional Peripherals and Accessories" on page 9-26.

3-5-11-2 Canon Pixma MP600/MP610

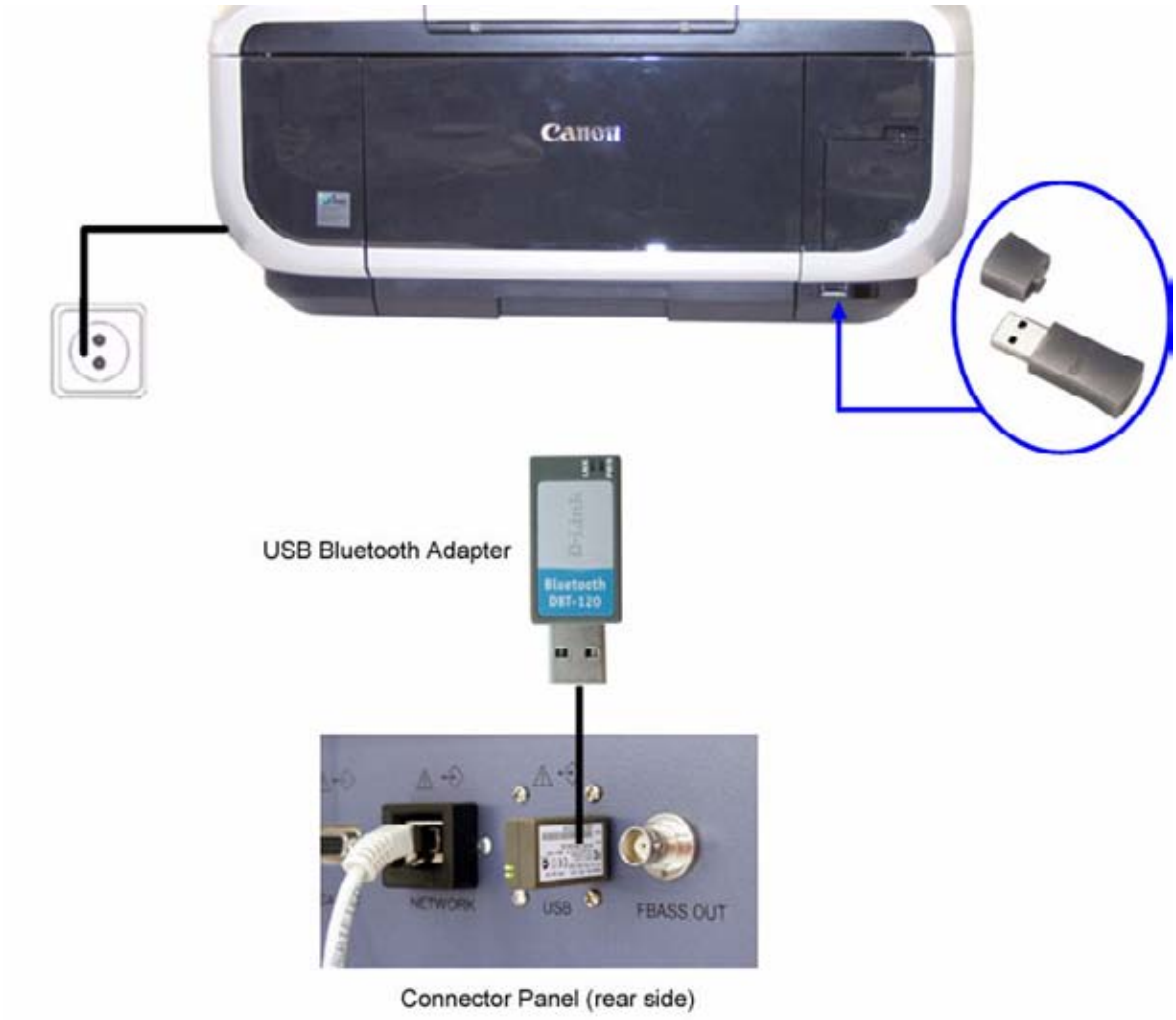


Figure 3-24 Canon Bluetooth Printer - Connection Scheme

CAUTION **Please observe that the complete Bluetooth Printer Assembly has to be located outside of the patient environment (acc. IEC 60601-1 / UL 60601-1).**

CAUTION **The Printer and the Bluetooth Printer Adapter used may not be a medical device. The equipment meets the requirements of the EN60950 Standard.**

NOTICE The switch of the printer has to be in ON position before starting the system. Leave printer switch always in the ON position.

3-5-12 Worldwide 19'' secondary "Patient" Monitor kit

This chapter gives you information, how to mount the additional Patient monitor to the wall and connect it to the Voluson® 730Pro/ProV.

Average Installation Time

One person, 45 minutes

Required parts (for Wall mount kit H48671EM Item No.: 820)

- Monitor: Dell, 1907 FP (KTI220525, KTZ220525)
- Wall Mount Kit: Ergotron FX30 (KTI220526, KTZ220526)
- Transformer: IMED300WR, 300VA (KTI300707, KTZ220714)
- VGA Cable (KTI220527, KTZ220527)
- Installation Manual (KTD102148, Revision 1)

Tools

- Philips screwdriver 2
- Allen key
- electrical drill
- slotted screwdriver or blade of a knife

NOTE: *It is also possible to order only the Isolation Transformer Kit (H48671WN) and use a different monitor. In this case observe the following:*

1.) The monitor must not be rated for more than 330W.
2.) The optimal screen resolution is:
Voluson® 730: 1024 x 768

The following connector plug is required on your Monitor to be able to connect it to the Transformer

Figure 3-25 IEC C14 plug

If you only use the Isolation Transformer, please proceed with 3-5-12-7 on page 3-29

3-5-12-1 Mounting the Monitor

NOTICE The monitor included in this package is not intended for diagnostic use. It is an additional device used to allow the patient to watch the proceedings.

NOTICE The monitor must **NOT** be connected to the main supply directly. Always connect the monitor to the transformer!

NOTICE DO NOT use original DELL accessories, like stand, powercable, VGA cable, USB cable, Dell CD ROM.

NOTICE All necessary modifications to wall and buildings must be performed by a professional to avoid structural damage and electrical hazard.

3-5-12-2 Preparation

1.) Unpack the monitor and dismount the monitor from its foot.
2.) Place it flat and screen down on a table.
3.) Unscrew the the 4 philips screws.

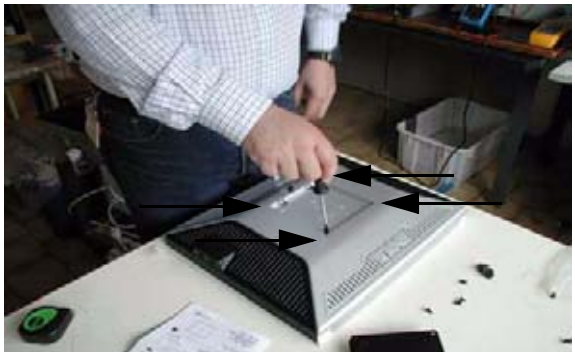


Figure 3-26 Unscrewing monitor screws (4th screw hidden behind hand)

3-5-12-3 Monitor bracket mount

1.) Place the monitor bracket mount in the indention in the middle of the rear of the monitor
2.) Fix the monitor bracket mount in place by screwing in the 4 philips screws.

Figure 3-27 Fixing monitor bracket mount

3-5-12-4 Sandwichplate

1.) Place the sandwich plate on top of the monitor bracket mount.
2.) Fix the sandwich plate in place by screwing in the 4 Allen screws.

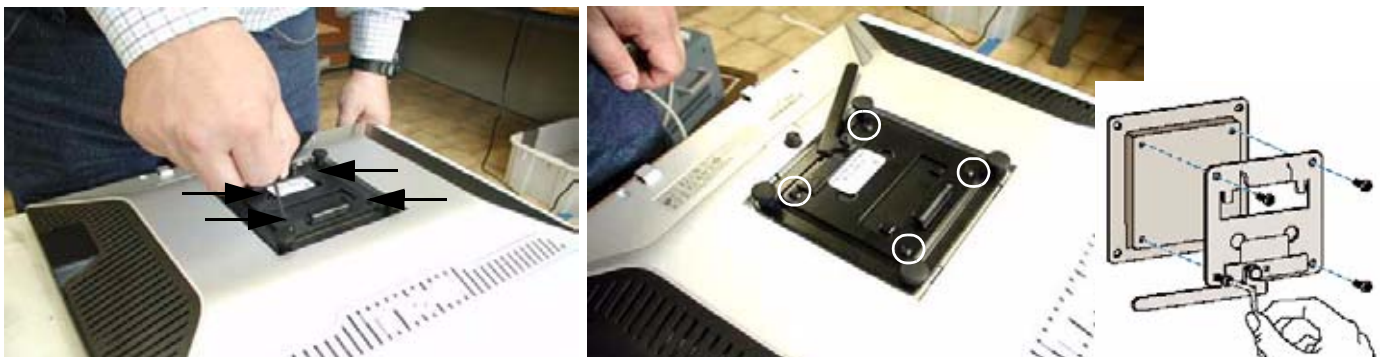


Figure 3-28 Fixing sandwich plate (left), position of Allen screws (right)

3-5-12-5 Wall Bracket Mount

Find out the exact position required, so patients can observe the monitor easily.

Figure 3-29 Wall Mount kit for 19" LCD Secondary Monitor

NOTICE Take your time to think about the best position of the monitor in your facilities. Patients should be able to view the monitor easily and without having to bend or turn around.

NOTICE All necessary modifications to wall and buildings must be performed by a professional to avoid structural damage and electrical hazard.

NOTICE Use adequate screws and wall plugs.

a.) Mark all the holes of the bracket mount on the wall. Make sure it is level.

b.) Drill the holes, using an electric drill.

c.) Fix the wall bracket mount by means of appropriate screws and wall dowels as shown in Table 3-30 below.

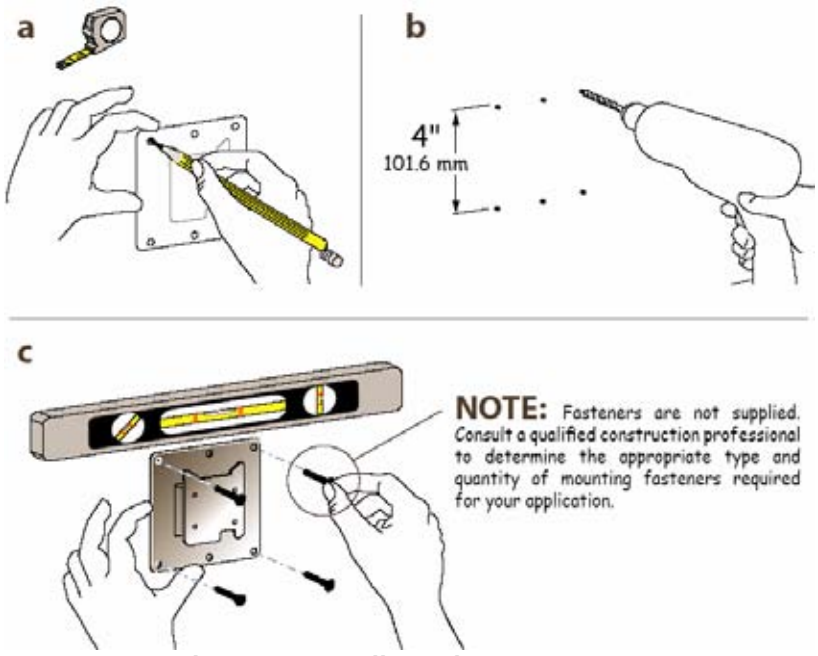

a
b
4"
101.6 mm
c
NOTE: Fasteners are not supplied. Consult a qualified construction professional to determine the appropriate type and quantity of mounting fasteners required for your application.

Figure 3-30 Wall Bracket Mount

3-5-12-6 Mounting and Locking Procedure

1.) Place the hook of the monitor bracket mount in the indention of the wallbracket mount to suspend the monitor.

2.) Rotate the locking lever until it is vertical. Now the monitor is mounted and secure.

NOTICE To rotate the lever to its locking position you need to press the unlock button of the monitor, as seen in Figure 3-31 below.

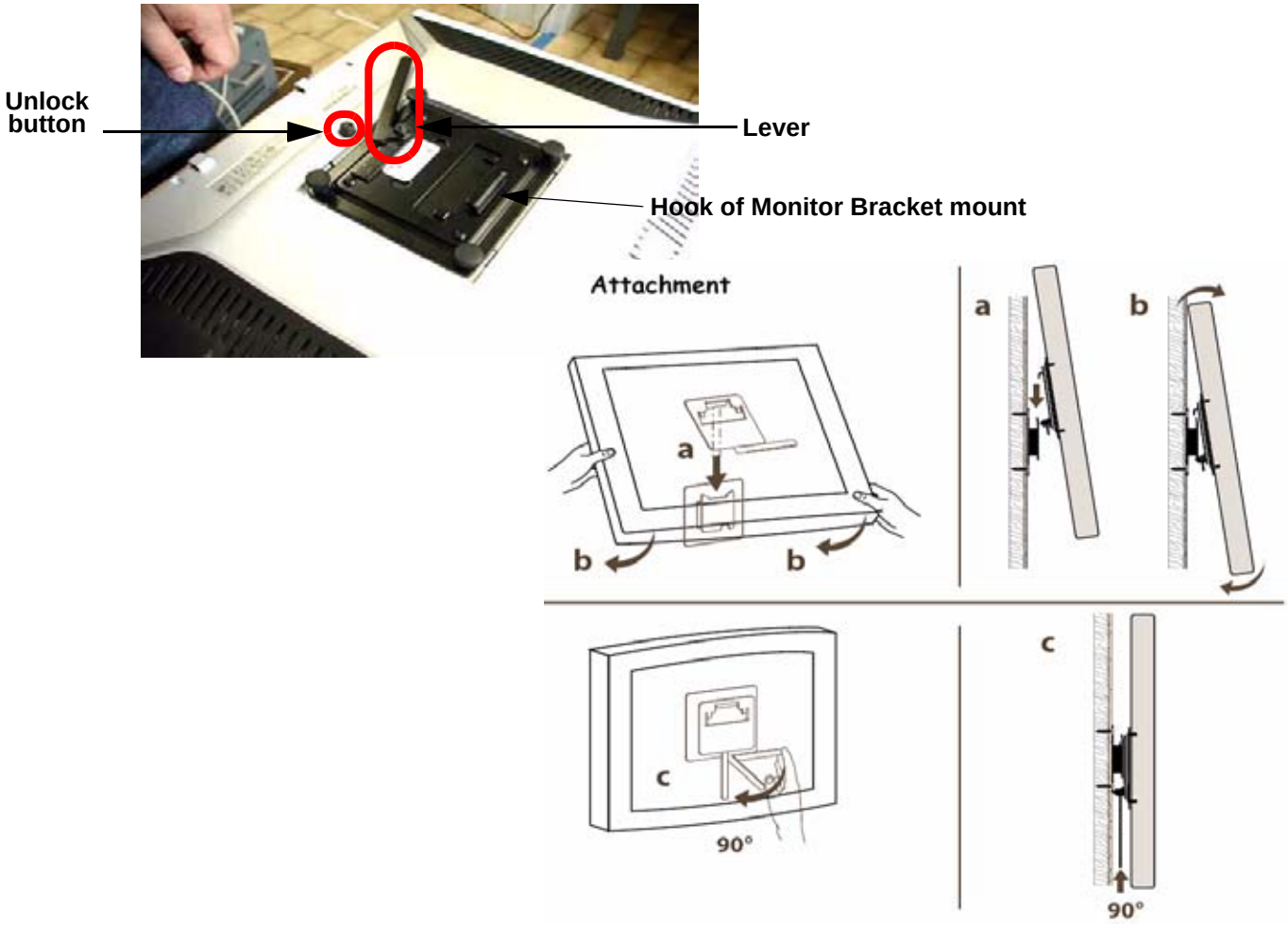


Figure 3-31 Mounting and Locking Procedure

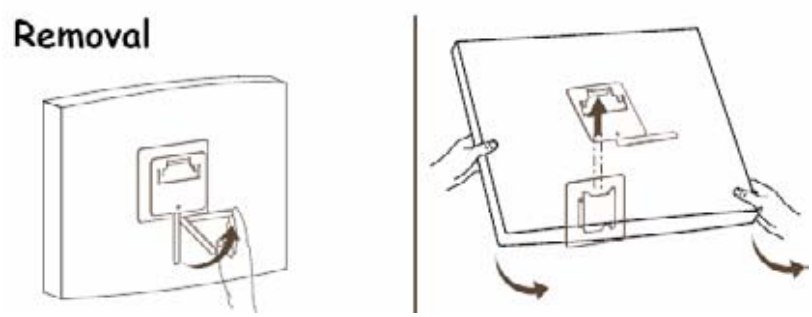


Figure 3-32 Removal Procedure

3-5-12-7 Mounting the Transformer

NOTICE The transformer is IPX 0. There is no protection against ingress of liquids!

Figure 3-33 Isolation Transformer kit for 19'' LCD Secondary Monitor

1.) Place the isolation transformer on the floor. The transformer must be out of the reach of the patient, however, it needs to be within cablelength from the monitor and a socket.

2.) Before using the Isolation Transformer you must check the input Voltage settings to meet the ratings of the line power available in your location or country.

3.) For changing the input voltage, open the power inlet block with a small screwdriver and remove the red fuse holder.

Figure 3-34 changing input voltage

4.) By turning the fuse holder you can switch between 115V and 230V. Consider that changing the input voltage also requires to change the fuses!

5.) The adjusted voltage can be seen in the viewing window after closing the fuse box.

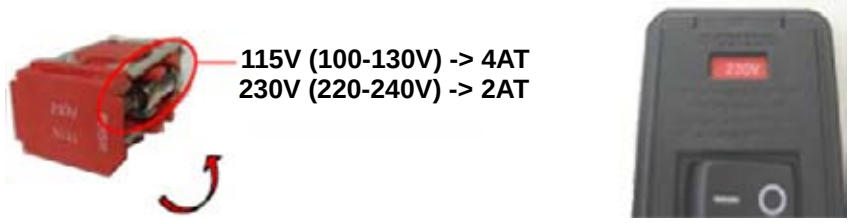


Figure 3-35 input voltage setting

3-5-12-7 Mounting the Transformer (cont'd)

6.) The output voltage must also be changed by the turn-switch, which is located on the right side.

7.) For that purpose use an appropriate screwdriver and make sure the the transformer is switched off.

For an Input-Voltage Range of 100-130V set to position A.
For an Input-Voltage Range of 220-240V set to position B.

Figure 3-36 output voltage setting

8.) Assure that the connected loads can be operated with the chosen voltage.

3-5-12-8 Rewiring

The VGA cable needs to be connected

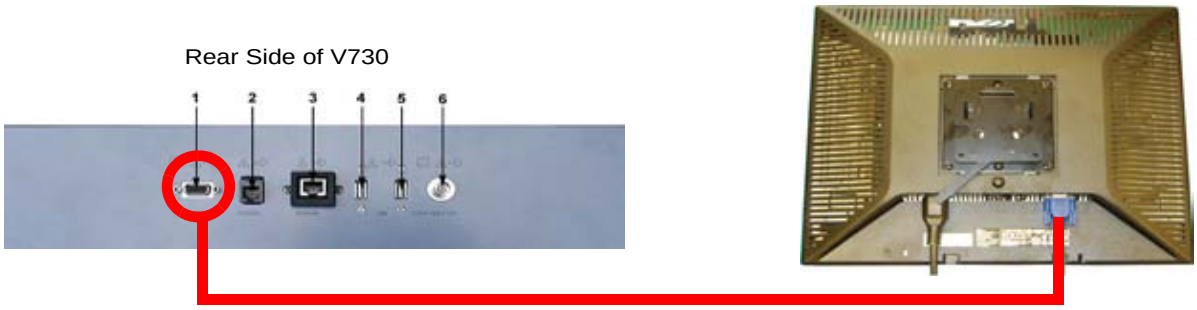


Figure 3-37 VGA Cable Connection Voluson® 730

NOTICE Do **NOT** try to connect the monitor to the systems via USB cable. Use the VGA cable.

NOTICE The monitor must **NOT** be connected to the main supply directly. Always connect the monitor to the transformer!

NOTICE The monitor is the only item to be connected to the transformer.

3-5-12-8 Rewiring (cont'd)

1.) Take the Isolation Transformer and connect the Transformer power cable and the Monitor cable, which is part of the kit (KTI220527).

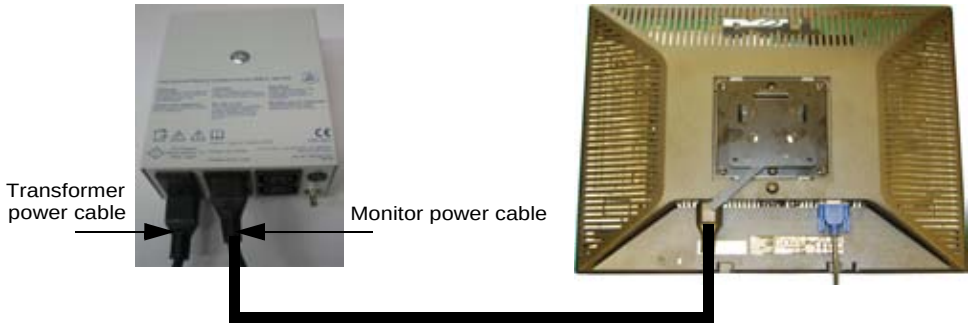


Figure 3-38 Connection of Transformer power cable and Monitor power cable

2.) Use this power switch to power on the Transformer. Wait ~1 minute before turning on your monitor.

Figure 3-39 power switch

3-5-12-9 Final check

NOTICE No message will verify that a new monitor is connected on the system screen.

1.) Switch on the monitor at the main switch of the monitor. Switch on the system.

Figure 3-40 Front side and main switch of Dell monitor

2.) Compare the picture on the newly installed monitor with the picture on the system monitor.

3.) If you need to change the configuration of the newly installed monitor, please, refer to the manual of the monitor, which is enclosed in the Wall mount kit.

4.) To ensure compliance with the system standard IEC 601-1.1 measure leakage current of the new system. For details: see 10-7 and see 10-8.

5.) Switch off the monitor at the main switch of the monitor. And switch off the system.

3-5-13 External USB-Devices

WARNING ***Do not connect or disconnect any external USB-devices to or from the system while scanning a patient! The appearing dialogs could distract you from the scan!***

3-5-13-1 External USB Devices - Connection

When an external USB-storage device (such as a USB-memory stick or external hard disk) is connected to the Voluson® 730Pro/ProV system, Windows detects the device and automatically installs a driver. During this process, several dialogs may pop up, starting with the „Found New Hardware“ dialog.

Figure 3-41 Found New Hardware - USB Device

The device is then accessible using the drive letter the system assigned to it.

NOTICE When connecting external USB devices, be sure to execute Safety Directions found in Chapter 2 of the Voluson® 730Pro/ProV Basic User Manual.

3-5-13-2 External USB Devices - Disconnection

Before an external USB-device (e.g., USB-memory stick) can be disconnected, the system has to be informed about the removal of the device! For this purpose the System Setup - **BACKUP** page (see: Figure 4-22 on page 4-32) has a STOP USB DEVICES button.

CAUTION **Unplugging or ejecting USB devices without first stopping them can often cause the system to crash and possibly result in loss of valuable data.**

By clicking the STOP USB DEVICES button, the „Unplug or Eject Hardware“ dialog is started. Using this dialog, the USB-devices can be stopped before they are physically disconnected.

Unplug or Eject Hardware
Select the device you want to unplug or eject, and then click Stop. When Windows notifies you that it is safe to do so unplug the device from your computer.
Hardware devices:
USB Mass Storage Device
USB Flash Drive USB Device
Generic volume - (G:)
USB Mass Storage Device
_NEC DVD+RW ND-1100A USB Device - (F:)
Generic volume - (G:) on USB Flash Drive USB Device
Stop
Close

Figure 3-42 Unplug or Eject Hardware

3-5-13-2 External USB Devices - Disconnection (cont'd)

The „Unplug or Eject Hardware" dialog shows all USB-devices that are connected to the system.
On every system is an USB mass storage device, the DVD/CD writer, which has the drive letter **(F:)**.
If the system has an optional MO-drive installed as well, it is listed too, and has the drive letter **(E:)**.

To stop the external device, select it and click the STOP button.
A dialog shows which components will be stopped. To finish the process, click [OK].

Stop a Hardware device
Confirm devices to be stopped, Choose OK to continue.
Windows will attempt to stop the following devices. After the devices are stopped they may be removed safely.
USB Mass Storage Device
Generic volume - (G:)
USB Flash Drive USB Device
OK
Cancel

Figure 3-43 Stop a Hardware device

Finally, a dialog shows that the device was stopped successfully.
The device can now be safely disconnected from the system.

Figure 3-44 Safe to Remove Hardware

By clicking OK, the „Unplug or Eject Hardware" dialog is active again.

Close this dialog by clicking CLOSE.

Afterwards select OK to reboot the system.

CAUTION **If the system's DVD/CD writer or (optional) MO-drive was stopped by accident, simply stop the external device as well and reboot the system.**
During reboot, the DVD/CD writer and the MO-drive will be installed again.

Section 3-6
Completing the Set Up

3-6-1 Connecting the Unit to a Power Source

The connection of the Voluson® 730Pro/ProV ultrasound unit to a power source should be performed by a qualified person who has completed basic Voluson® 730Pro/ProV System User Training. Use only the power cords, cables and plugs provided by or designated by GE Healthcare to connect the unit to the power source.

CAUTION **Prior to connect the Voluson® 730Pro/ProV unit to a power source, verify compliance with all electrical and safety requirements. Check the power cord to verify that it is intact and of hospital-grade. Products equipped with a power source (wall outlet) plug should be connected to the fixed power socket that has a protective grounding conductor. Never use an adapter or converter to connect with a power source plug (for example, a three-prong to two-prong converter).**

WARNING ***The unit's power must be supplied from a separate, properly rated outlet to avoid risk of fire. Refer to Section 2-2-2-1 "Voluson® 730Pro/ProV Power Requirements" on page 2-2 for rating information. The power cord should not, under any circumstances, be altered to a configuration rated less than that specified for the current.***

CAUTION **Whenever disconnecting the Voluson® 730Pro/ProV unit from the electrical outlet, always observe the safety precautions. First unplug the main power cable from the wall outlet socket, then from the unit itself. Remove by pulling on the cable connector - DO NOT pull on the cable.**

CAUTION **The Voluson® 730Pro/ProV requires all covers!**
Operate this system only when all board covers and frame panels are securely in place.
The covers are required for safe operation, good system performance and cooling purposes.

3-6-2 Power On / Boot Up

3-6-2-1 Scanner Power On

1.) Connect the Power Cable to the back of the system.
2.) Connect the Main Power Cable to a hospital grade power receptacle with the proper rated voltage. Never use an adapter that would defeat the safety ground.
3.) Switch ON the Circuit Breaker at the rear of the system.

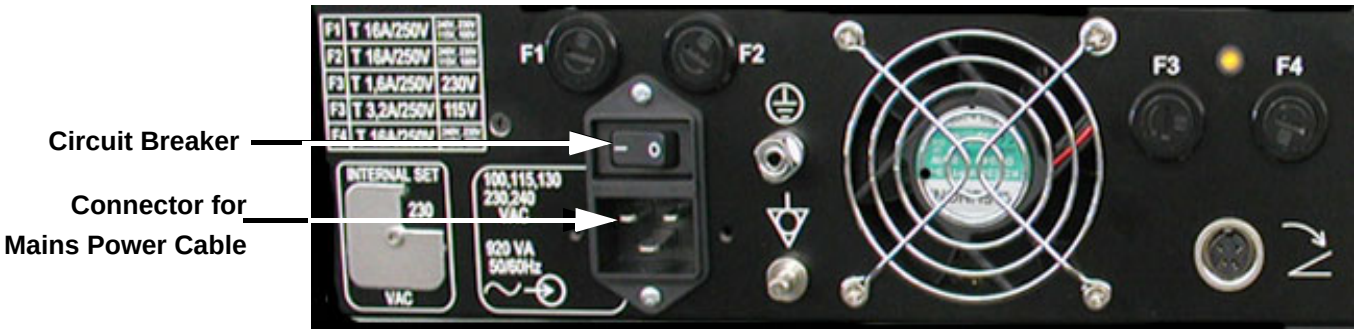


Figure 3-45 Circuit Breaker at rear of system

NOTICE When AC power is applied to the scanner, the **ON/OFF** switch on the control panel is illuminated, indicating that the System (including the Back-end Processor) is in standby mode.

3-6-2-2 Back-end Processor Boot Up

Press the **ON/OFF** Standby switch left below the Control Panel.

Figure 3-46 ON/OFF Standby Switch

NOTE: The mains outlet of the system for peripheral auxiliary equipment are commonly switched with the Standby switch. The switch of printers has to be in ON position before starting the system. However, be aware some auxiliary equipment may switch itself to standby mode when Standby power is on (e.g., Color video printer) and must therefore be switched on separately.

When the **ON/OFF** Standby switch left below the Control Panel is pressed, the System (including the Back-end Processor) starts and the operating system is loaded which then leads the application software to activate the scanner.

The system automatically performs an initialization sequence which includes the following:

- Loading the operating system.
- Running a quick diagnostic check of the system.
- Detecting connected probes

As soon as the software has been loaded, the system enters 2D-Mode with the probe and application that were used before the system was shut down.

NOTE: Total time used for start-up is about 2 minutes.

3-6-3 Power Off/ Shutdown

NOTICE After turning off a system, wait at least 10 seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

3-6-3-1 Back-end Processor Power Down

1.) Press the **ON/OFF** Standby switch left below the Control Panel; see: Figure 3-46.

3-6-3-2 Scanner Shutdown

1.) Press the **ON/OFF** Standby switch left below the Control Panel.
2.) Switch OFF the Circuit Breaker at the rear of the system.

NOTE: The mains outlet of the system for peripheral auxiliary equipment are commonly switched with the Standby switch. So the auxiliary equipment need not to be switched ON/OFF separately.

WARNING ***Disconnection of the Main Power Cable is necessary! For Example: When repairing the system.***

3.) After complete power down, unscrew the 2 screws and remove the pull-out protection to disconnect the main power cable from the system or unplug it from the AC wall outlet socket.

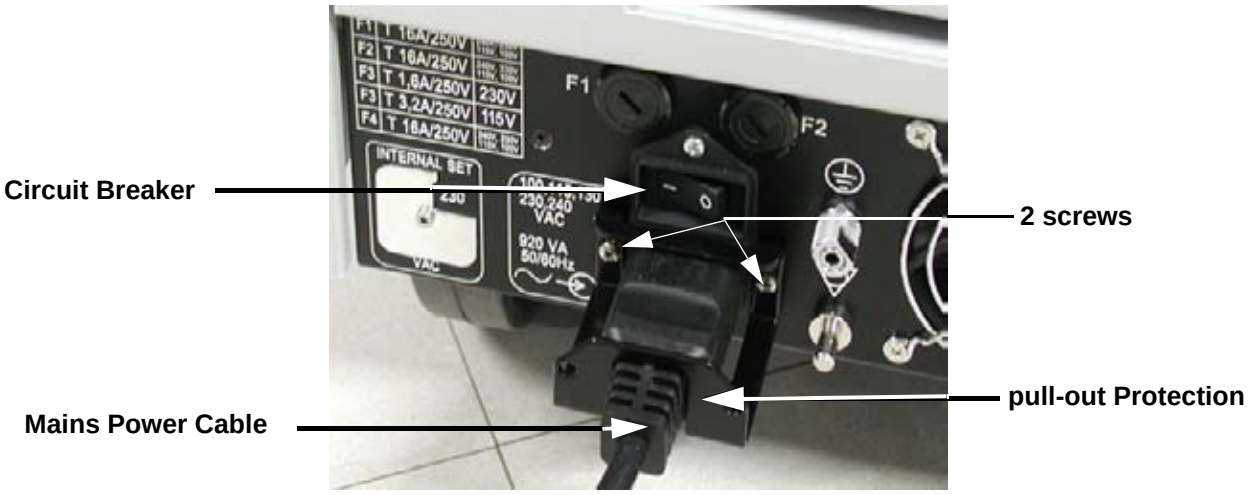


Figure 3-47 Circuit Breaker, Protection and Power Cable on back of Voluson® 730Pro/ProV

4.) Press once on the brakes to block the front wheels (brakes on front wheels under the foot rest).
5.) Disconnect probes. (Turn the probe locking handle counterclockwise and then pull the connector straight out of the probe port.)

CAUTION **DO NOT disconnect a probe while running (Live Scan "Write" mode)! A software error may occur. In this case switch the unit OFF (perform a reset).**

3-6-4 Transducer Connection

Connect a transducer to one of the three rightmost transducer receptacle as follows:

1.) Inspect the probe and probe socket to verify that it is free of debris.

2.) Ensure that the probe locking lever is at horizontal position.

3.) Insert the transducer connector on the receptacle guide pin until it touches the receptacle mating surface.

4.) Twist the transducer twist lock lever to vertical position to lock it in place.
Twist the lever to the horizontal position to disconnect the transducer.

Figure 3-48 Transducer Connection

⚠ **CAUTION** **Do not** bend the probe cable acutely. **Fault conditions can result in electric shock hazard.**
Do not touch the surface of probe connectors which are exposed when the probe is removed.
Do not touch the patient when connecting or disconnecting a probe.

NOTE: *Prior to connecting or disconnecting a probe, freeze the image.*
It is not necessary to turn OFF power to connect or disconnect a transducer.

Section 3-7
Printer Installation

NOTE: *For Connection schemes refer to Section 3-5 "Connection of Auxiliary Devices" on page 3-9.*

For further installation instructions see:

- Section 3-7-1 "Installing Line Printer HP 990cxi or HP 995c" on page 3-39.
- Section 3-7-2 "Installing Digital Color Printer Sony UP-D23MD or UP-D25MD" on page 3-41.
- Section 3-7-3 "Installing Digital Black & White Printer Sony UP-D897" on page 3-43
- Section 3-7-4 "Installing Mitsubishi B&W P95 and Color Printer CP30" on page 3-45
- Section 3-7-5 "Printer Installation manually" on page 3-47.
- Section 3-7-6 "Adjustment of Printer Settings" on page 3-52.

CAUTION **The Bluetooth Printer Connection set as well as the Color Deskjet printer MUST NOT be installed by the user!**

For installation please contact your local distributor or GE service representative.

3-7-1 Installing Line Printer HP 990cxi or HP 995c

1.) Power off/Shutdown the system as described in: Section 3-6-3 on page 3-36.

2.) Connect the printer as described on page 3-9 and reinstall the rear cover plate.

NOTE: For connection schemes refer to Section 3-5-9 on page 3-21.

NOTICE Do not connect the USB-cable to the printer!

NOTE: "Mouse functions" can be performed by using the trackball for moving the cursor.
"Normal select" (Click) = left/right trackball key ; "Opening a context menu" = upper trackball key

3.) Turn ON the printer, then switch ON the power of the system and wait till the system has booted.

NOTE: The power switch of the printer has to be in ON position before starting the system!

3-7-1-1 Install the HP 990cxi or HP 995c printer software/driver

Perform the following steps if this printer was never installed on the Voluson® 730Pro/ProV!

4.) Connect the USB cable to the printer and the system. The windows 'Searching for Drivers …', 'Found new Hardware …' and finally the following windows appear.

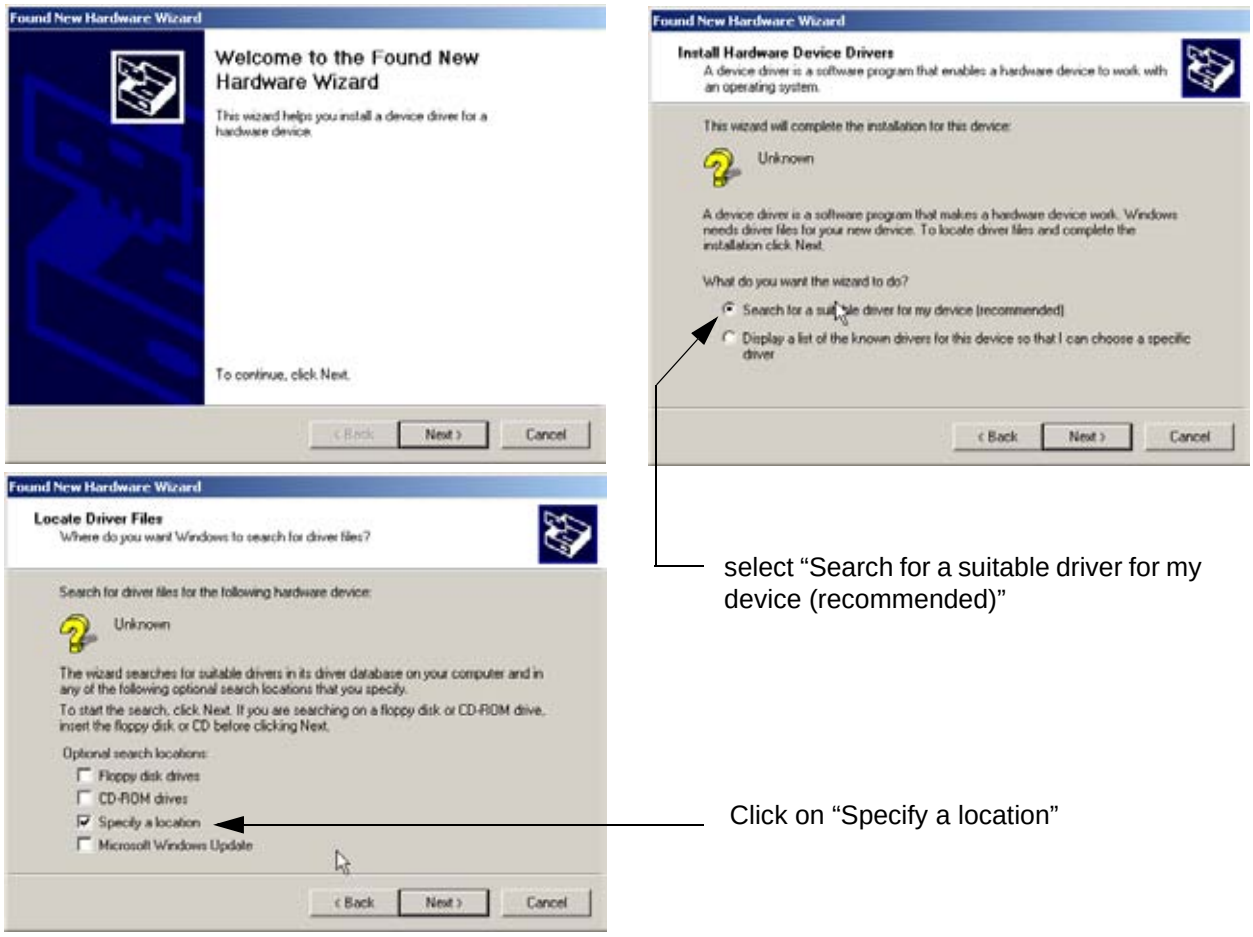

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install a device driver for a hardware device.
To continue, click Next.
< Back
Next >
Cancel
Found New Hardware Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device:
Unknown
A device driver is a software program that makes a hardware device work. Windows needs driver files for your new device. To locate driver files and complete the installation click Next.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel
select "Search for a suitable driver for my device (recommended)"
Found New Hardware Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
Unknown
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel
Click on "Specify a location"

Figure 3-49 Found New Hardware Wizard

3-7-1-1 Install the HP 990cxi or HP 995c printer software/driver (cont'd)

5.) Click the NEXT buttons to start the Hardware Wizard and to locate the driver files.

6.) Use the BROWSE button to search the following path on the hard disk (see: Figure 3-50)

- **C:\Utilities\PrinterDriver\HPDeskjet990c** for HP 990cxi
- **C:\Utilities\PrinterDriver\HPDeskjet995c** for HP 995c, and then click OK.

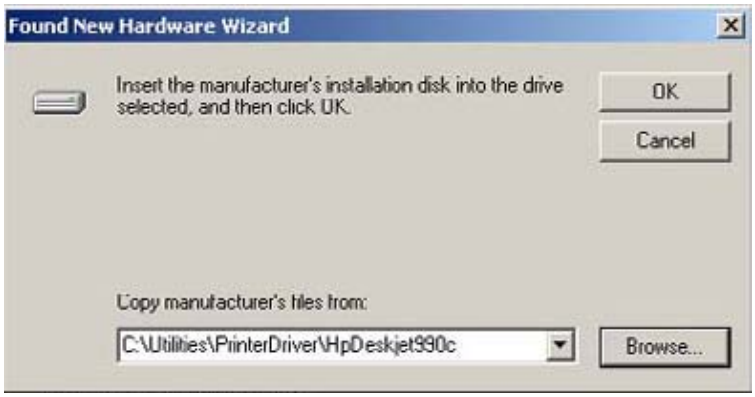


Figure 3-50 Search for Network path on hard disk

7.) Confirm the correct path and click NEXT to install the driver. All necessary files are copied.

8.) Confirm the installation by clicking FINISH to close the Hardware Wizard.

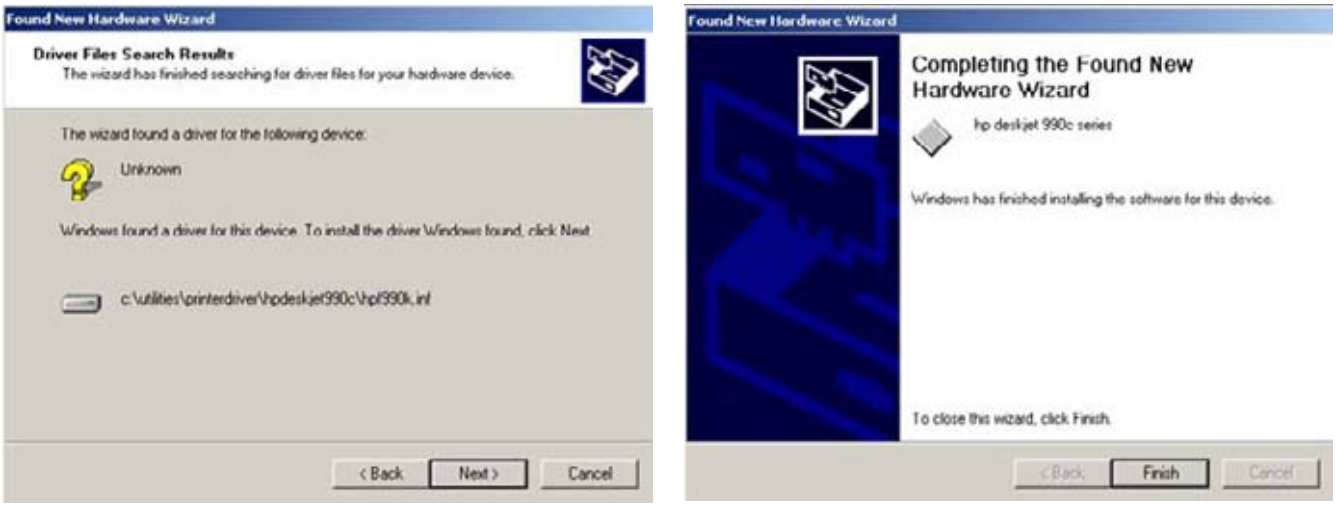

Found New Hardware Wizard
Driver Files Search Results
The wizard has finished searching for driver files for your hardware device.
The wizard found a driver for the following device:
Unknown
Windows found a driver for this device. To install the driver Windows found, click Next.
c:\utilities\printerdriver\hpdeskjet990c\hpf990k.inf
< Back
Next >
Cancel
Found New Hardware Wizard
Completing the Found New Hardware Wizard
hp deskjet 990c series
Windows has finished installing the software for this device.
To close this wizard, click Finish.
< Back
Finish
Cancel

Figure 3-51 Confirm correct path and finish the Installation

9.) Close all open windows and restart the system (turn off and on the system).

NOTICE After boot up of the system, verify the correct settings in the printer "Properties", see: Section 3-7-6 "Adjustment of Printer Settings" on page 3-52.

3-7-2 Installing Digital Color Printer Sony UP-D23MD or UP-D25MD

1.) Power off/Shutdown the system as described in: Section 3-6-3 on page 3-36.

2.) Connect the printer as described on page 3-9 and reinstall the rear cover plate.

NOTE: For connection schemes refer to Section 3-5-10 on page 3-22 .

NOTICE Do not connect the USB-cable to the printer!

NOTE: "Mouse functions" can be performed by using the trackball for moving the cursor.
"Normal select" (Click) = left/right trackball key ; "Opening a context menu" = upper trackball key

3.) Turn ON the printer, then switch ON the power of the system and wait till the system has booted.

NOTE: The power switch of the printer has to be in ON position before starting the system!

3-7-2-1 Install the UP-D23MD / UP-D25MD printer software/driver

Perform the following steps if this printer was never installed on the Voluson® 730Pro/ProV!

1.) Connect the USB cable to the printer and the system. The windows 'Searching for Drivers …', 'Found new Hardware …' and finally the following windows appear.

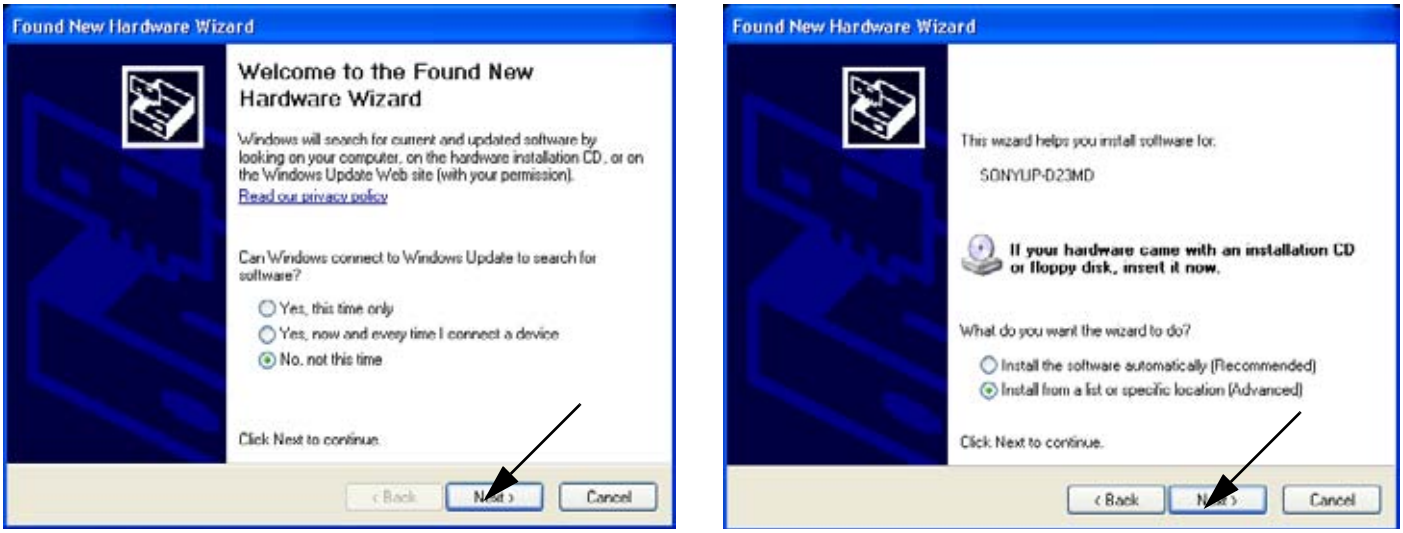

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel
Found New Hardware Wizard
This wizard helps you install software for:
SONYUP-D23MD
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

Figure 3-52 Found New Hardware Wizard

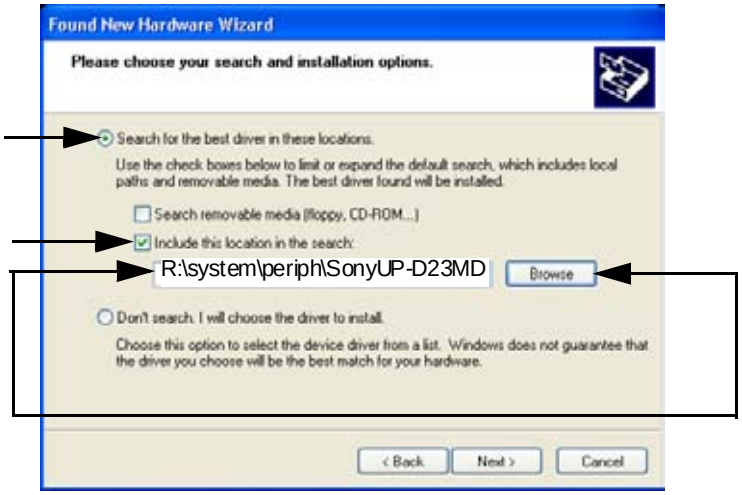
2.) Select "No, not this time" and verify with NEXT.

3.) In the next window, select "Install from a list or specific location!" and then click on NEXT.

4.) Select "Search for the best driver in these locations" and check mark "Include this location in the search" (see: Figure 3-52 on page 3-41).

3-7-2-1 Install the UP-D23MD / UP-D25MD printer software/driver (cont'd)

NOTE: If path (R:\system\....) is different from what is shown in Figure 3-56, click on the BROWSE button to search correct driver.


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
R:\system\periph\SonyUP-D23MD
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

verify correct path, otherwise [Browse] for

R:\system\periph\SonyUP-D23MD

Figure 3-53 Search for Network path

5.) Confirm the correct path and click NEXT to install the driver. All necessary files are copied.

6.) If the following Warning message appears, click CONTINUE ANYWAY.

Hardware Installation
The software you are installing for this hardware:
Printers
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

Figure 3-54 Finish installation

7.) Confirm the installation by clicking FINISH to close the Hardware Wizard.

8.) Close all open windows and restart the system (turn off and on the system).

NOTICE After boot up of the system, verify the correct settings in the printer "Properties", see: Section 3-7-6 "Adjustment of Printer Settings" on page 3-52.

3-7-3 Installing Digital Black & White Printer Sony UP-D897

1.) Power Off/Shutdown the system as described in: Section 3-6-3 on page 3-36.

2.) Connect the printer as described on page 3-20.

NOTICE Do not connect the USB-cable to the printer!

NOTE: "Mouse functions" can be performed by using the trackball for moving the cursor. "Normal select" (Click) = left/right trackball key ; "Opening a context menu" = upper trackball key

3.) Turn ON the printer, then switch ON the power of the system and wait till the system has booted.

NOTE: The power switch of the printer has to be in ON position before starting the system!

3-7-3-1 Install the UP-D897 printer software/driver

Perform the following steps if this printer was never installed on the Voluson® 730Pro/ProV!

1.) Connect the USB cable to the printer and the system. The windows 'Searching for Drivers …', 'Found new Hardware …' and finally the following windows appear.

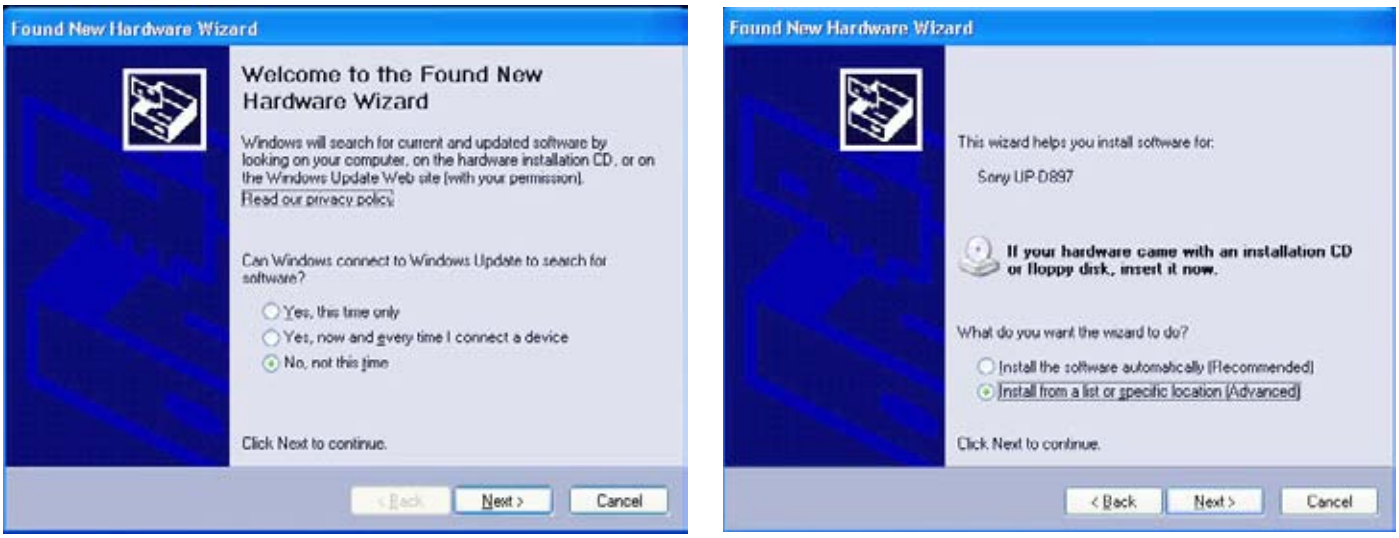

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel
Found New Hardware Wizard
This wizard helps you install software for:
Sony UP-D897
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

Figure 3-55 Found New Hardware Wizard

2.) Select "No, not this time" and verify with NEXT.

3.) In the next window, select "Install from a list or specific location!" and then click on NEXT.

4.) Select "Search for the best driver in these locations" and check mark "Include this location in the search" (see: Figure 3-56 on page 3-44).

3-7-3-1 Install the UP-D897 printer software/driver (cont'd)

NOTE: If path (R:\system\....) is different from what is shown in Figure 3-56, click on the BROWSE button to search correct driver.

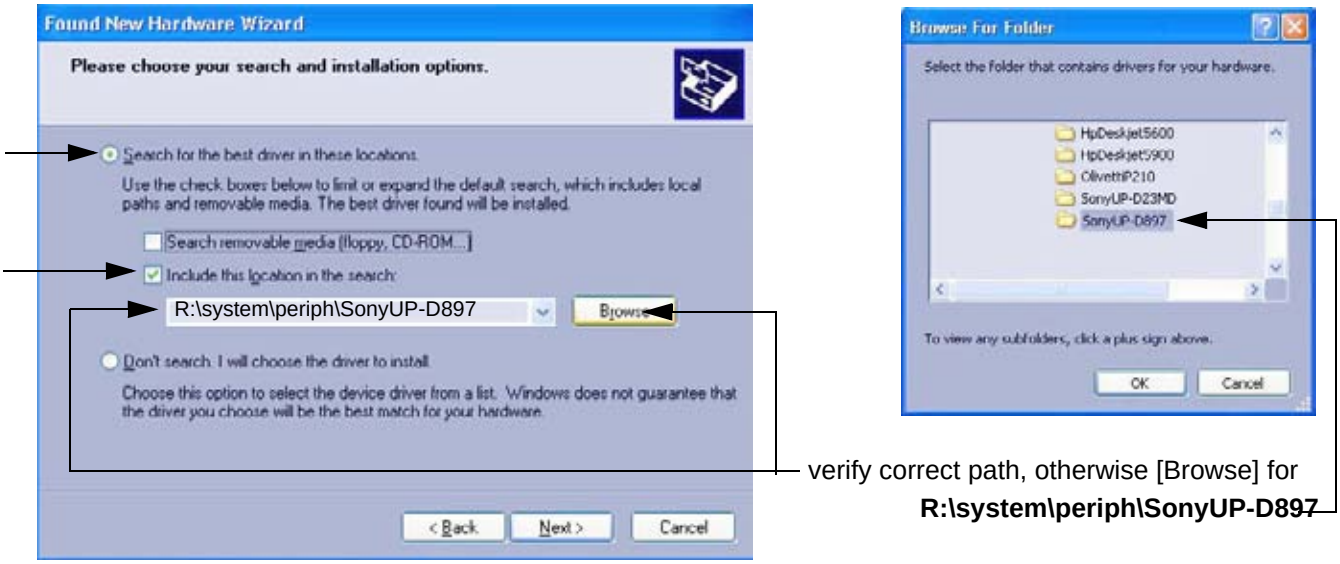

Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
R:\system\periph\SonyUP-D897
Browse...
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel
Browse For Folder
Select the folder that contains drivers for your hardware.
HpDeskjet5600
HpDeskjet5900
OlivettiP210
SonyUP-D23MD
SonyUP-D897
To view any subfolders, click a plus sign above.
OK
Cancel
verify correct path, otherwise [Browse] for
R:\system\periph\SonyUP-D897

Figure 3-56 Search for Network path

5.) Confirm the correct path and click NEXT to install the driver. All necessary files are copied.

6.) If the following Warning message appears, click CONTINUE ANYWAY.

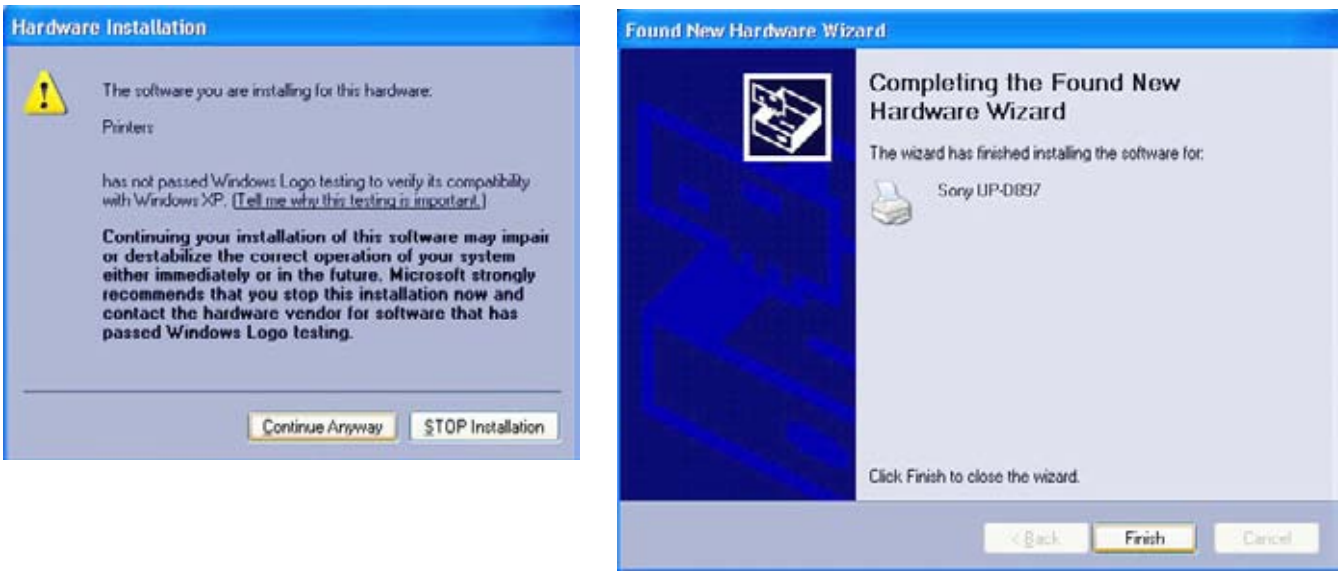

Hardware Installation
The software you are installing for this hardware:
Printers
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation
Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
Sony UP-D897
Click Finish to close the wizard.
< Back
Finish
Cancel

Figure 3-57 Finish installation

7.) Confirm the installation by clicking FINISH to close the Hardware Wizard.

8.) Close all open windows and restart the system (turn off and on the system).

⚠ **NOTICE** After boot up of the system, verify the correct settings in the printer "Properties", see: Section 3-7-6 "Adjustment of Printer Settings" on page 3-52.

3-7-4 Installing Mitsubishi B&W P95 and Color Printer CP30

NOTE: Mouse functions" can be performed by using the trackball for moving the cursor. "Normal select" (Click) = left/right trackball key; "Opening a context menu" = upper trackball key

NOTE: To use the Mitsubishi Printer with older Systems and Software versions a printer driver has to be installed. A printer driver disk is included with the new printer.

NOTE: If you use the Printer, please always take the same USB port.

NOTE: If the same system software version (where Mitsubishi driver installation was performed) is re-installed by performing "Restore", "Initialize" and "New Disk" via LINUX, this printer will be found again as a new hardware device when connecting it to the system. The printer driver will have to be installed again via hardware wizard. Please be sure to leave the printer driver disk at the customer site with the other current software discs.

NOTE: Dip-Switch Settings for the Color Printer (KTZ302616); 1 and 2 ON; 3, 4, 5, 6, 7 and 8 OFF.

NOTE: If you use the B&W Printer (KTZ302617) you must first activate USB Serial number.
1.) The Printer must be switched OFF.
2.) Press the "COPY" and "CONT" button together and switch ON the Printer.
When the display shows "S1" let off the both button.
3.) Press the "FUNC" button; the display shows "U0".
4.) Adjust to "U2" by using the turning knob.
5.) Press the "FUNC" button again and then switch OFF the Printer.

1.) Connect the printer to the system.
2.) Switch ON the power of the system and wait till the system has booted and then turn ON the printer.
3.) The "Found New Hardware Wizard" window appears.

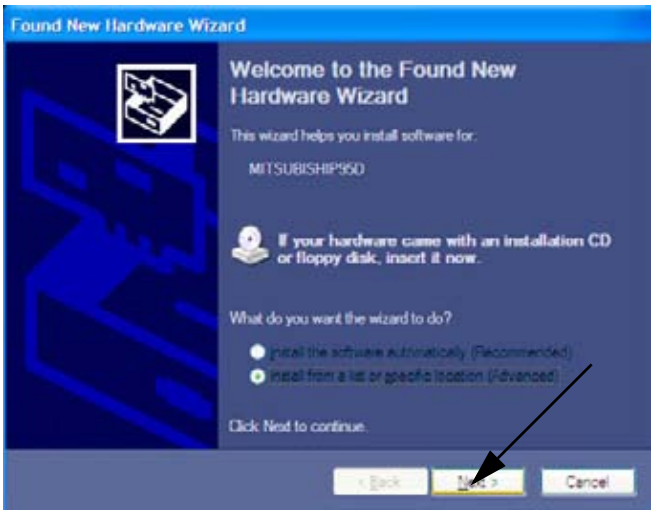

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
MITSUBISHIP950
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Click Next to continue.
Cancel

Figure 3-58 Found New Hardware Wizard / select "Install from ..."

4.) Select "**Install from a list or specific location**" and click on NEXT.

3-7-4 Installing Mitsubishi B&W P95 and Color Printer CP30 (cont'd)

5.) In the next window select "**Search for the best driver in these locations**", select "**Include this location in the search:**" and browse for the right path. "R:**system\periph\Mitsubishi P95D**" for the B&W Printer and "R:**system\periph\Win2000_XP**" for the Color Printer or "C:**Utilities\PrinterDriver\Mitsubishi PD95**" for the B&W Printer and "C:**Utilities\PrinterDriver\Win2000_XP**" for the Color Printer. Path depeD95 or F:\Win2000_XP. (where F: stands for CD/DVD Drive) Then click on NEXT.

NOTE: If the "Printer Driver" Disk is defective or not available, download driver from GE folders http://libraries.ge.com/foldersIndex.do?entity_id=15869258101&sid=101&SF=1 *and extract files to CD or USB disk.*

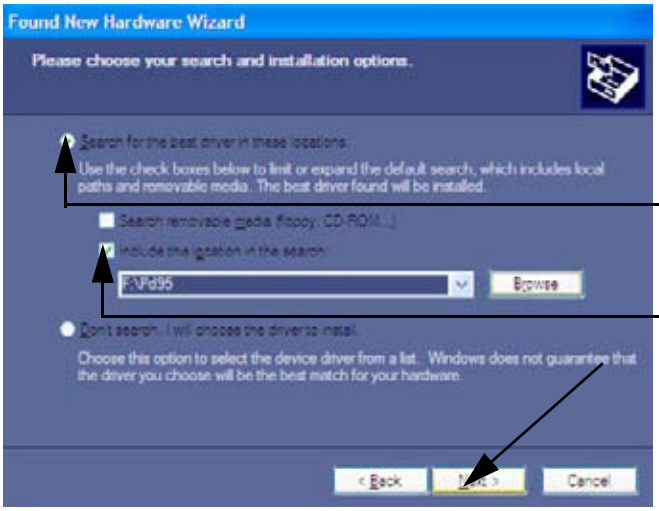

Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
F:\Pd95
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel
"Search for the best driver in these location"
"Include this location in the search"

Figure 3-59 select "Search for the ..." and "Include this location ..."

6.) Confirm the installation by clicking FINISH to close the Hardware Wizard.

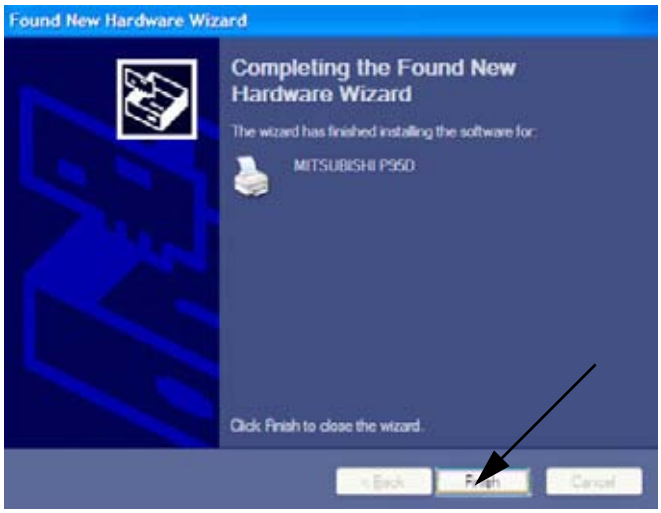


Figure 3-60 Finish installation

7.) Close all open windows and verify the correct settings in the printer "Properties", see: Section 3-7-6 "Adjustment of Printer Settings" on page 3-52.

3-7-5 Printer Installation manually

1.) On the control panel, press the **UTILITIES** key.

2.) In the “Utilities” menu on the left side of the screen, select SYSTEM to invoke the setup desktop.

3.) Select the SERVICE page. The “password window” appears automatically.

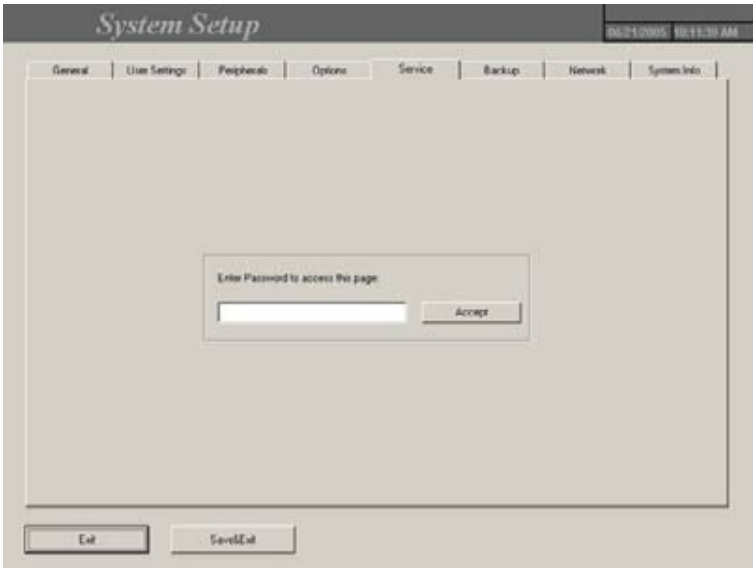


Figure 3-61 System Setup Service page

4.) Enter the password SHE and click the ACCEPT button to display the Service Tools window.

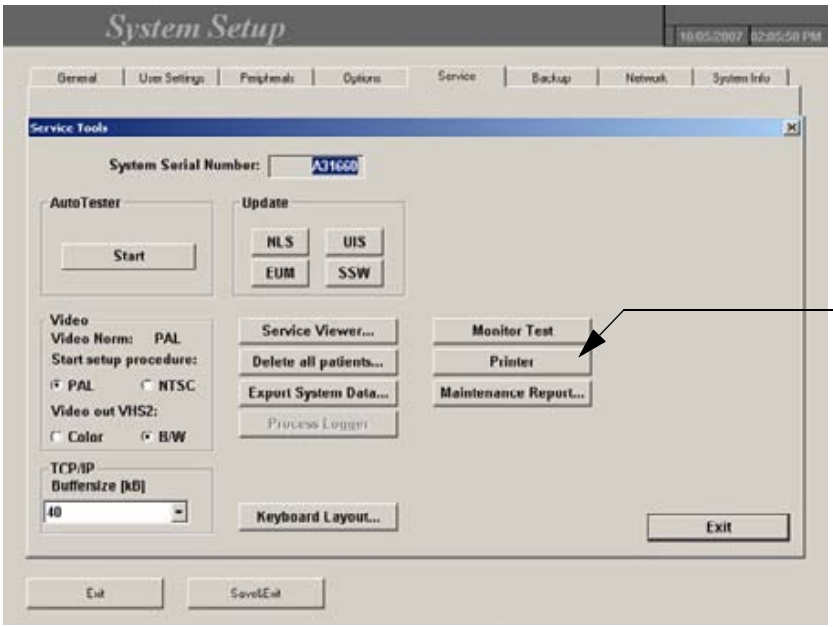


Figure 3-62 Service Tools window

5.) Click on the PRINTER button.

3-7-5 Printer Installation manually (cont'd)

6.) Click the ADD PRINTER button.

A warning message appears:
Please read this message carefully and click YES if you have skills to do this.

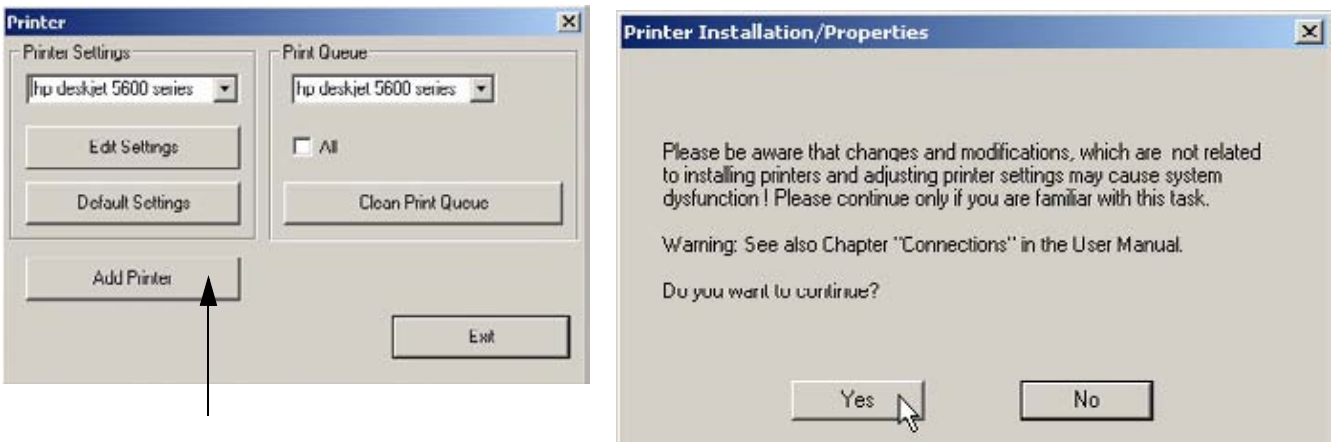

Printer
Printer Settings
hp deskjet 5600 series
Edit Settings
Default Settings
Print Queue
hp deskjet 5600 series
All
Clean Print Queue
Add Printer
Exit
Printer Installation/Properties
Please be aware that changes and modifications, which are not related to installing printers and adjusting printer settings may cause system dysfunction ! Please continue only if you are familiar with this task.
Warning: See also Chapter "Connections" in the User Manual.
Do you want to continue?
Yes
No

Figure 3-63 Add Printer and Printer Installation/Properties

7.) Click the NEXT button to start the Add Printer Wizard.

8.) Select the 'Local Printer', deselect "Automatically install Plug and Play printer" and then click NEXT.

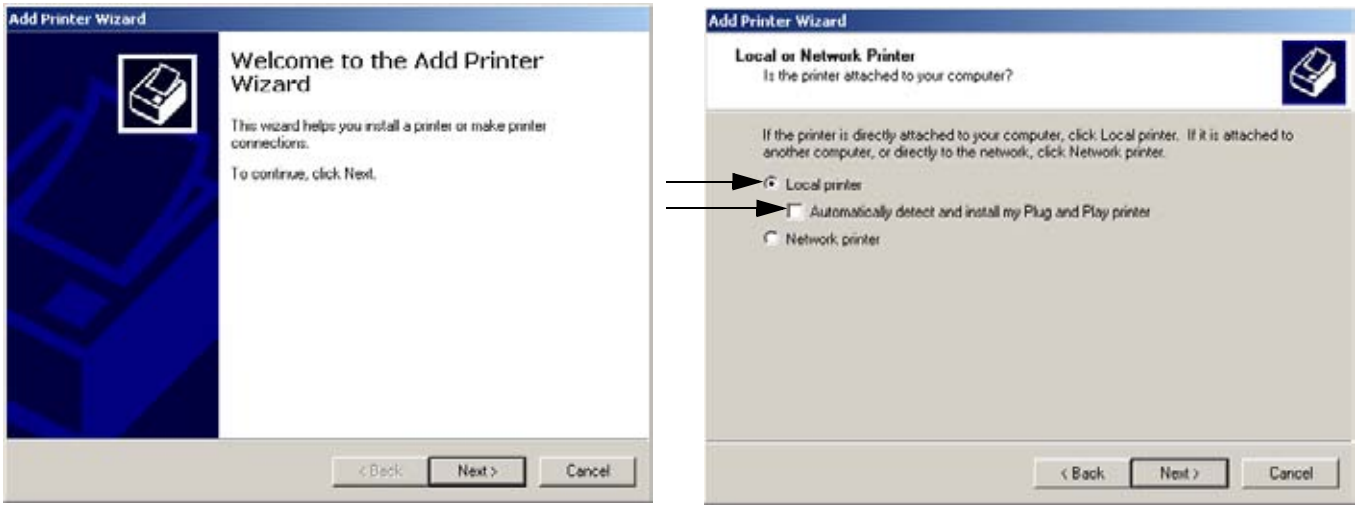

Add Printer Wizard
Welcome to the Add Printer Wizard
This wizard helps you install a printer or make printer connections.
To continue, click Next.
< Back
Next >
Cancel
Add Printer Wizard
Local or Network Printer
Is the printer attached to your computer?
If the printer is directly attached to your computer, click Local printer. If it is attached to another computer, or directly to the network, click Network printer.
Local printer
Automatically detect and install my Plug and Play printer
Network printer
< Back
Next >
Cancel

Figure 3-64 Add Printer Wizard

3-7-5 Printer Installation manually (cont'd)

9.) Select the corresponding Printer Port (e.g., Figure 3-65 = USB001) and click NEXT.

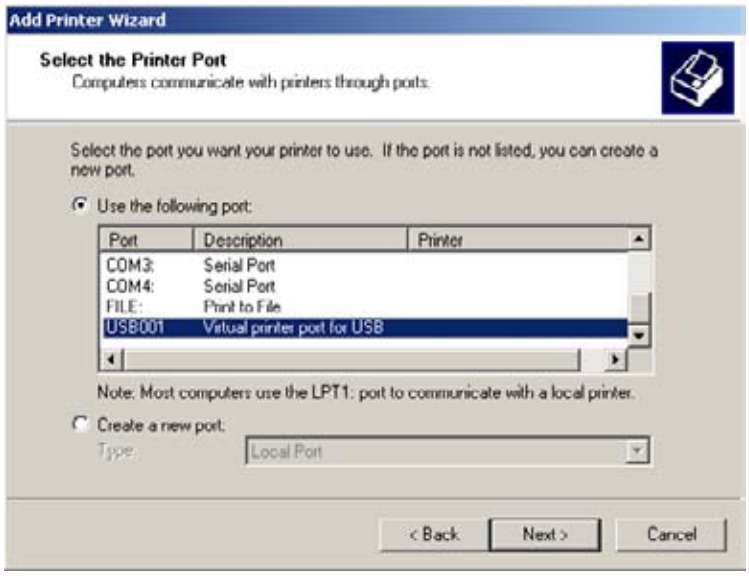


Figure 3-65 Select Printer Port

10.) In the following window select the HAVE DISK button.

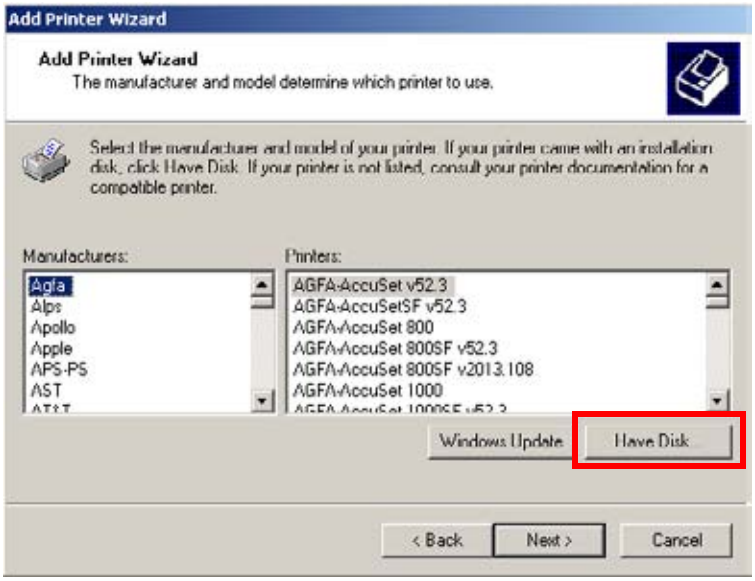


Figure 3-66 Have Disk...

11.) Use the BROWSE button to search the Printer Driver path (**C:\Utilities\PrinterDriver\xxxx**).

3-7-5 Printer Installation manually (cont'd)

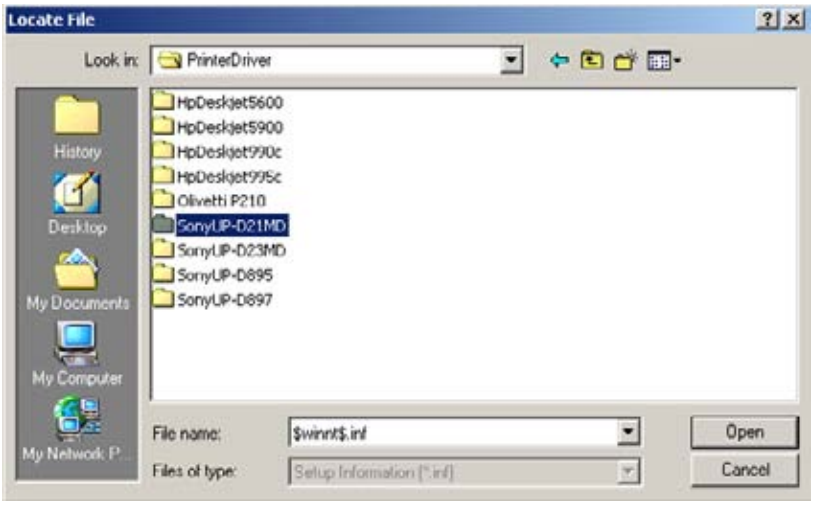


Figure 3-67 Select Printer Driver path (C:\Utilities\PrinterDriver\....)

12.) Click OPEN, select the "xxx.inf" file and click OPEN again.
13.) Verify the selected Printer Driver path and confirm with OK.

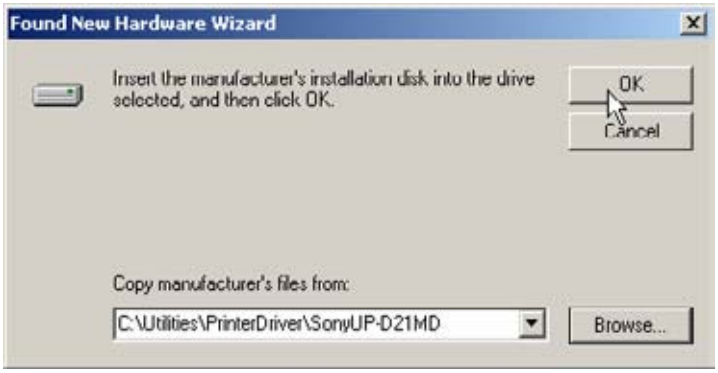


Figure 3-68 verify selected Printer Driver path

14.) Select the manufacturer and model of your printer and confirm with the NEXT button.

3-7-5 Printer Installation manually (cont'd)

15.) Assign a name, decide if the printer should be used as default printer and confirm with NEXT. see: Figure 3-69.

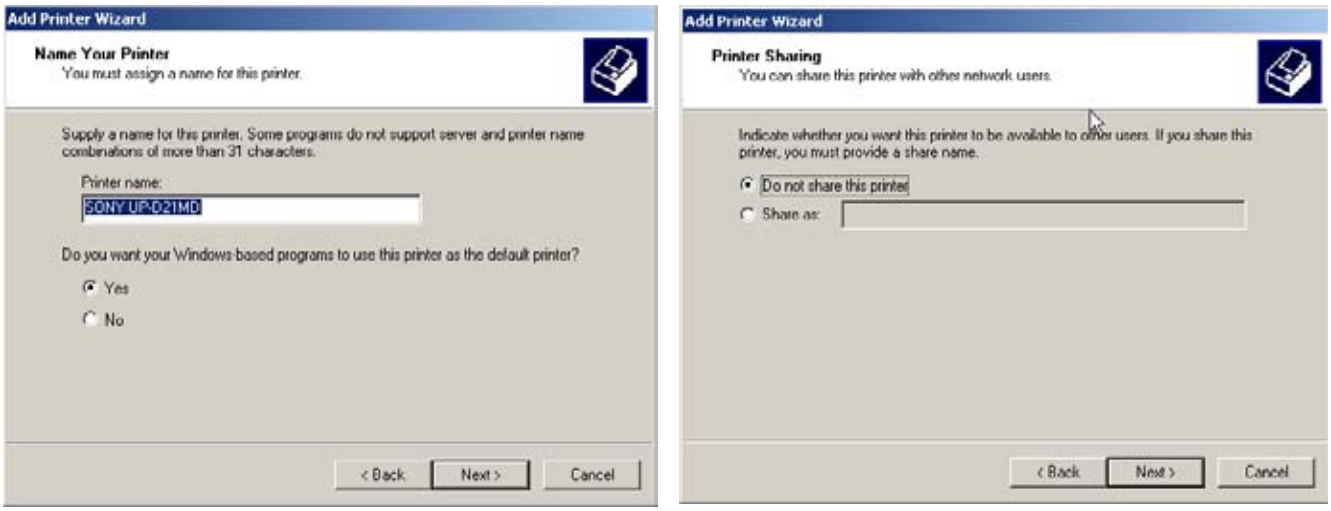

Add Printer Wizard
Name Your Printer
You must assign a name for this printer.
Supply a name for this printer. Some programs do not support server and printer name combinations of more than 31 characters.
Printer name:
SONY UP-D21MD
Do you want your Windows-based programs to use this printer as the default printer?
Yes
No
< Back
Next >
Cancel
Add Printer Wizard
Printer Sharing
You can share this printer with other network users.
Indicate whether you want this printer to be available to other users. If you share this printer, you must provide a share name.
Do not share this printer
Share as:
< Back
Next >
Cancel

Figure 3-69 Assign name and select Printer Sharing - no

16.) Select 'Do not share this printer' and confirm the "Printer Sharing" window (Figure 3-69) by clicking NEXT.

17.) The "Complete the Add Printer Wizard" window appears on the screen.

Figure 3-70 Complete manual Printer Installation

18.) Complete the manual Printer Installation with the FINISH button.

19.) Close all open windows, close the "System Setup" with SAVE & EXIT and restart the system (turn off and on the system).

NOTICE After boot up of the system, verify the correct settings in the printer "Properties", see: Section 3-7-6 "Adjustment of Printer Settings" on page 3-52.

3-7-6 Adjustment of Printer Settings

1.) After system restart, press the **UTILITIES** key, and then select SYSTEM from the menu area.
2.) Select the SERVICE page. The “password window” appears automatically.
3.) Enter the password SHE and click the ACCEPT button.
4.) Click on the PRINTER button.
5.) Select the desired printer from the pull-down menu and click the EDIT SETTINGS button.
6.) Confirm the warning message with the YES button. The **“Printer Properties”** appear.

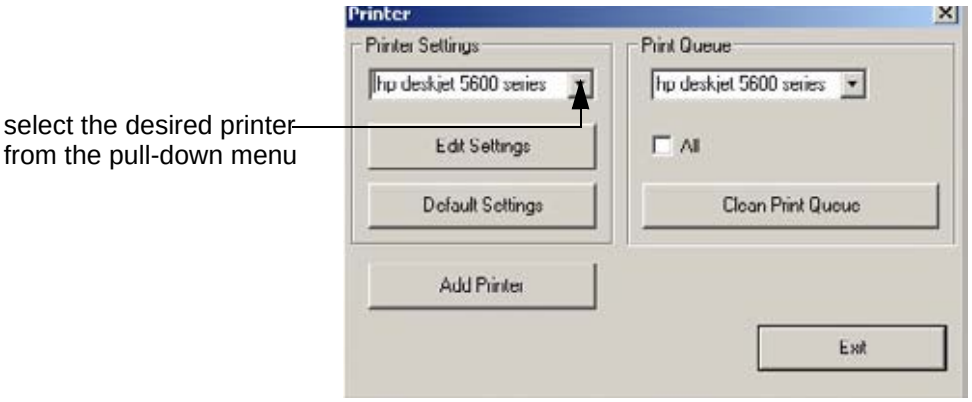


Figure 3-71 Select the desired printer

To adjust the Line Printer see: Section 3-7-6-1 "HP 990cxi / HP 995c- Printer Settings" .

To adjust the Color Printer see: Section 3-7-6-2 "UP-D23MD / UP-D25MD - Printer Settings" .

To adjust the CP30D Color Printer see: Section 3-7-6-3 "Mitsubishi Printer - Settings"

To adjust the Black&White Printer see: Section 3-7-6-4 "UP-D897 - Printer Settings" .

To adjust the Bluetooth printer see: Section 3-7-6-5 "Bluetooth Deskjet - Printer Settings"

WARNING ***After each printer installation, the leakage currents have to be measured acc. IEC 60601-1 resp. UL2601-1.***

3-7-6-1 HP 990cxi / HP 995c- Printer Settings

1.) Call up the **'Printer Properties'**; operation see: Section 3-7-6 "Adjustment of Printer Settings" .

2.) Select the **GENERAL** page and click the PRINTING PREFERENCES... button.

3.) Select the **SETUP** page for adjusting print quality and paper size.
"Paper type" should be set to 'Automatic'. See left Figure 3-72.

4.) Select the **FEATURES** page for adjusting 'Two-Side Printing' if desired.
"Orientation" must be set to 'Portrait'. See right Figure 3-72.

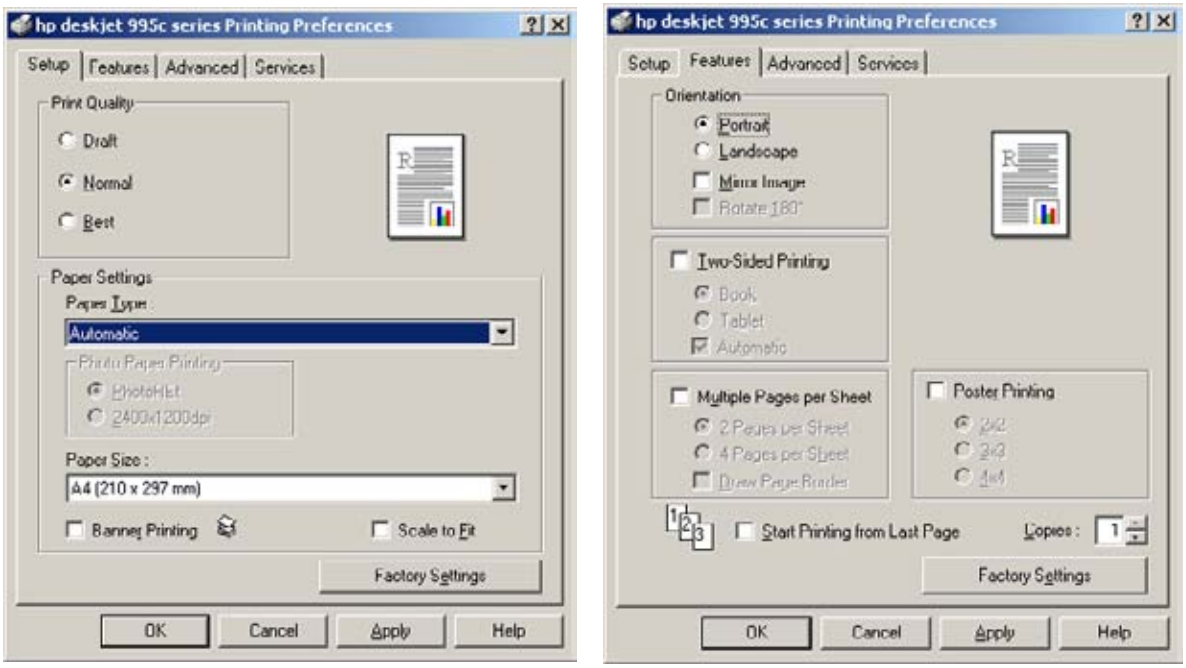


Figure 3-72 HP Printer - Settings

5.) For saving the adjusted printer settings click APPLY and then OK.

6.) Select the **PORTS** page and selct/verify the correct USB printer port.

7.) For saving the adjusted printer settings click APPLY and then OK.
Finally close the 'Printers' -window with the close button and exit System Setup with SAVE&EXIT.

8.) Assign the HP 990cxi / HP 995c printer as Report Printer;
see: Section 3-7-7 "Remote Control Selection" on page 3-59.

9.) Print report page(s) containing measurements.
For operation see Basic User Manual of Voluson® 730Pro/ProV.

10.) **Turn off** the system!

3-7-6-2 UP-D23MD / UP-D25MD - Printer Settings

1.) Call up the **'Printer Properties'**; operation see: Section 3-7-6 "Adjustment of Printer Settings" .

NOTICE Settings for Paper Size MUST match with the used Paper (large/small) and also the right color ink cartridge has to be used. Otherwise you will get an error message at printing.

2.) Select the **PAPER** page and select:

- Paper Size: **UPC-23L** (large) / UPC-23S (small)
- Orientation: **Landscape** (recommended when using large paper size)
- **High Speed** (check mark on)

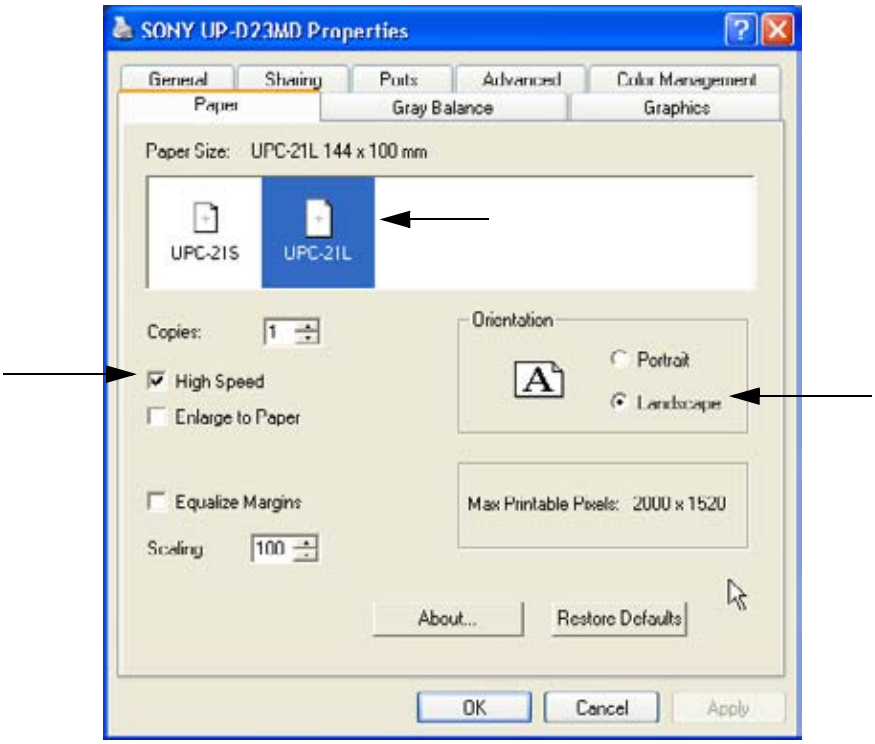


Figure 3-73 Paper page

3-7-6-2 UP-D23MD / UP-D25MD - Printer Settings (cont'd)

3.) Select the **GRAPHICS** page. From the "Color Adjust" pop-up menu select:

a.) Color Balance: Cyan = **0**; Magenta = **0**; Yellow = **0**

b.) Gamma Select: **Gamma 1**

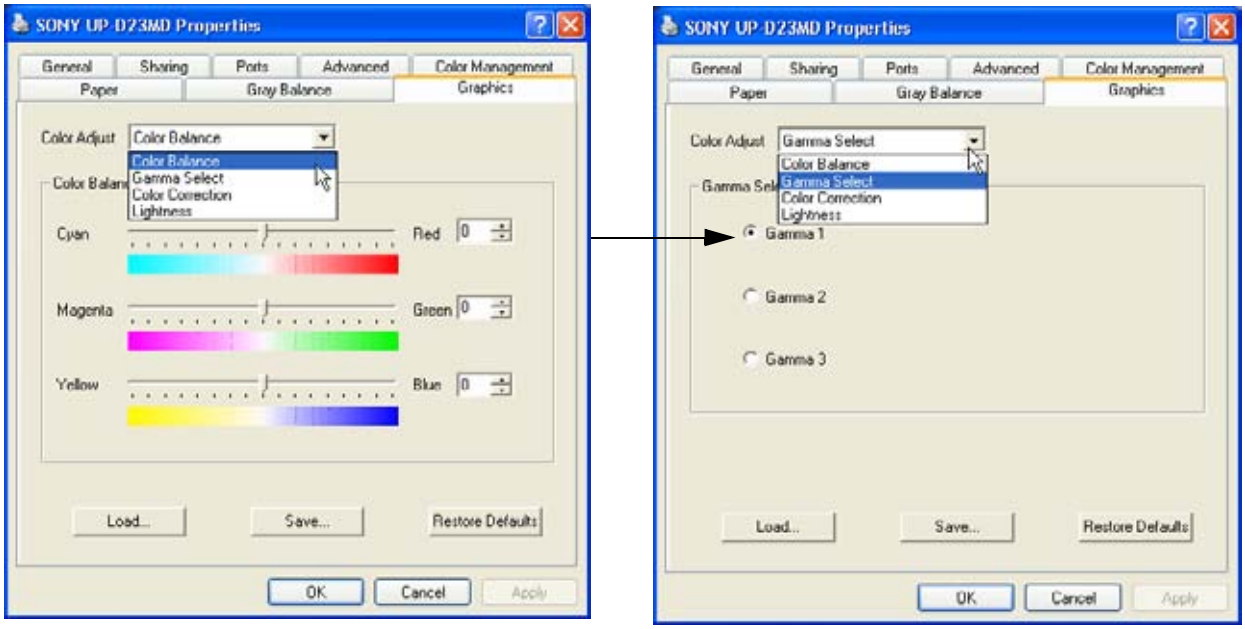


Figure 3-74 Graphics page (Color Balance + Gamma Select)

c.) Color Correction: set **Printer Hardware Color Correction**

d.) Lightness: Sharpness = **7** or **8**; Dark = **0**; Gamma = **-12**; Light = **8**

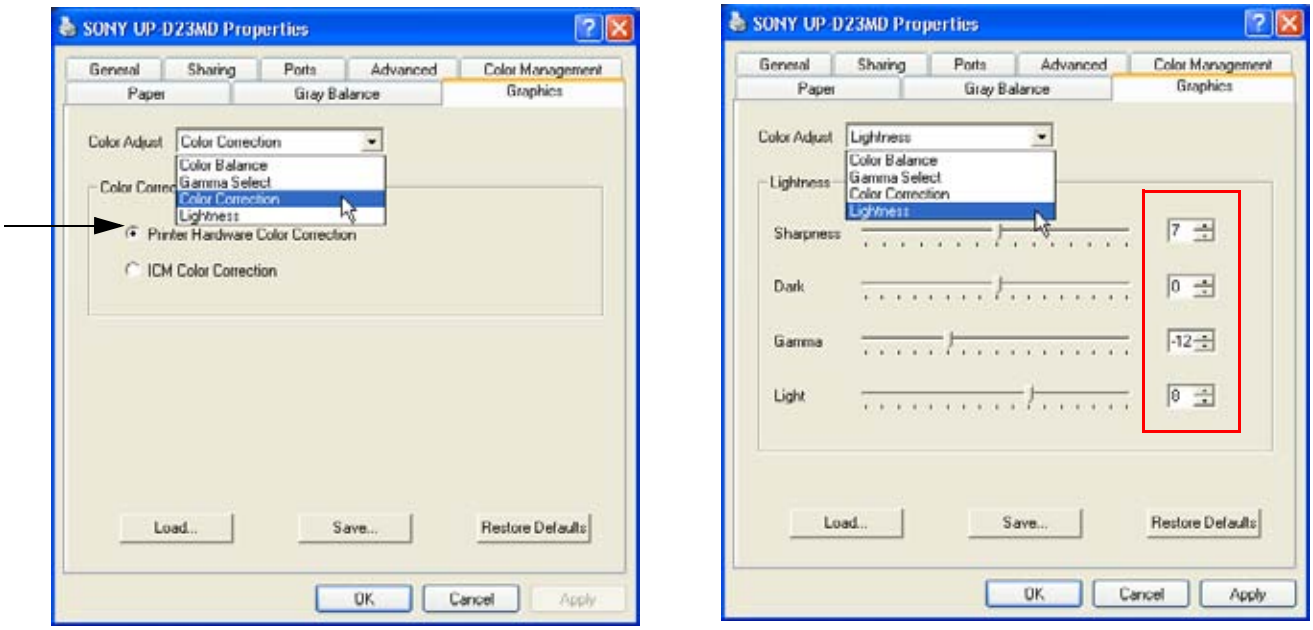


Figure 3-75 Graphics page (Color Correction + Lightness)

4.) For saving the adjusted printer settings click APPLY and then OK.
Finally close the 'Printers'-window with the close button and exit System Setup with SAVE&EXIT.

5.) Assign the Printer to remote keys **PRINT A** and/or **PRINT B**; see: Section 3-7-7 on page 3-59.

3-7-6-3 Mitsubishi Printer - Settings

3-7-6-3-1 Color Printer CP30

1.) Call up the **'Printer Preferences'**; operation see: Section 3-7-6 "Adjustment of Printer Settings" .

2.) Select the **PAPER** page and select:

- Paper Size: L (large)
- Orientation: Landscape (recommended when using large paper size)

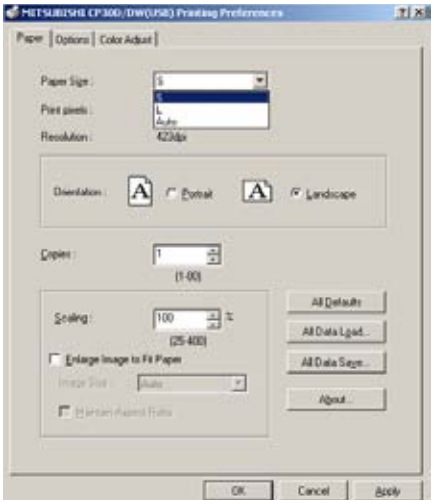


Figure 3-76 Paper page

3.) For saving the adjusted printer settings click APPLY and then OK. Finally close the "Printer Preferences" window with the close button and exit System Setup with SAVE&EXIT.

3-7-6-3-2 B&W Printer P95

1.) Printer Settings directly on the B&W Printer:

a.) Press the "BRT" button on the printer and adjust Brightness to "0" by using the turning knob.

b.) Press the "CONT" button on the printer and adjust Contrast to "0" by using the turning knob.

c.) Press the "SHARP" button on the printer and adjust Sharpness to "3" by using the turning knob.

d.) Press the "FUNC" button on the printer and adjust Gamma to "r5" by using the turning knob.

For saving and exit press the "BRT" button twice.

Brightness: 0

Contrast: 0

Sharpness: 3

Gamma: 5

Figure 3-77 Printer Settings - B&W Printer

If necessary remove the CD and **restart** the system (turn off and on the system).

3-7-6-4 UP-D897 - Printer Settings

1.) Call up the **'Printer Properties'**; operation see: Section 3-7-6 "Adjustment of Printer Settings" .

2.) Select the **LAYOUT** page (see: Figure 3-78 below) and select:

- Paper: **960x1280**
- Orientation: **Portrait**
- Interpolation Method: **Bilinear**

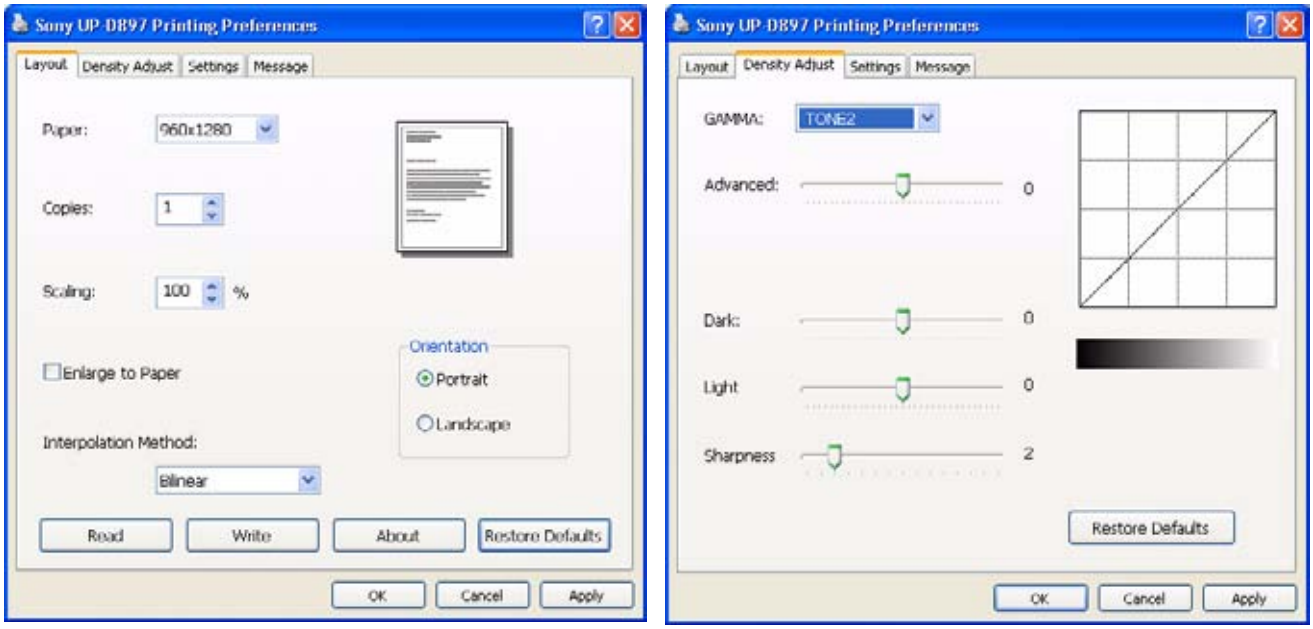


Figure 3-78 Layout + Density Adjust page

3.) Select the **DENSITY ADJUST** page (see: Figure 3-78 above) and select:

- Gamma: **TONE2**
- Sharpness = **0**; Dark = **0**; Light = **0** ; Sharpness = **2**

4.) For saving the adjusted printer settings click APPLY and then OK.
Finally close the 'Printers' -window with the close button and exit System Setup with SAVE&EXIT.

5.) Assign the Printer to the remote keys **PRINT A** and/or **PRINT B**;
see: Section 3-7-7 "Remote Control Selection" on page 3-59.

3-7-6-5 Bluetooth Deskjet - Printer Settings

CAUTION **The Bluetooth Connection Set as well as the color printer MUST NOT be installed by the user! For installation please contact your local distributor or GE service representative.**

1.) Call up the **'Printer Properties'**; operation see: Section 3-7-6 "Adjustment of Printer Settings" .

2.) Select the **GENERAL** page and click the PRINTING PREFERENCES... button.

3.) Select the **PAPER/QUALITY** page and select the adequate paper size.

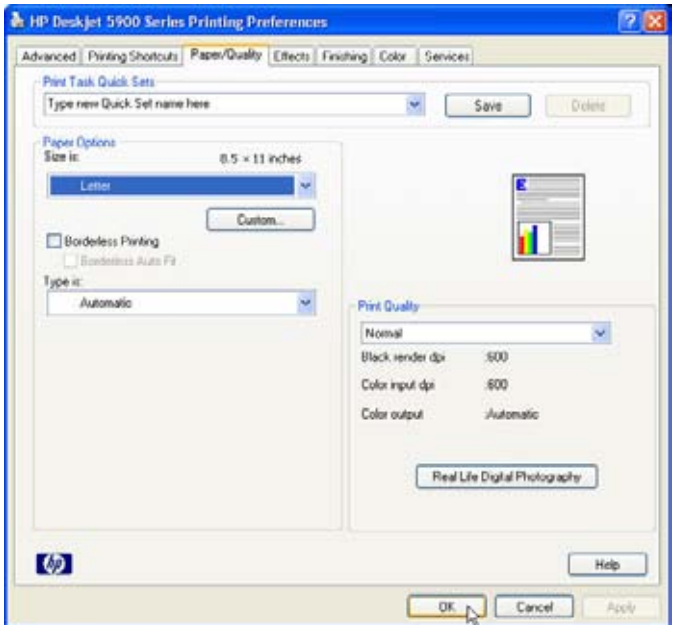


Figure 3-79 Paper/Quality page

4.) For saving the adjusted paper size settings click APPLY and then OK.

5.) In the next window, click OK again.
Finally close the 'Printers' -window with the close button and exit System Setup with SAVE&EXIT.

6.) Assign the Deskjet printer as Report Printer;
see: Section 3-7-7 "Remote Control Selection" on page 3-59.

7.) Print report page(s) containing measurements.
For operation see Basic User Manual of Voluson® 730Pro/ProV.

8.) **Turn off** the system!

3-7-7 Remote Control Selection

To assign an auxiliary device (e.g., printer) to the remote keys **PRINT A** and/or **PRINT B**, or to adjust Record Type, Foot switch, etc.:

1.) On the control panel, press the **UTILITIES** key.
2.) In the "Utilities" menu on the left side of the screen select SYSTEM to invoke the setup desktop.
3.) Select the PERIPHERALS page.

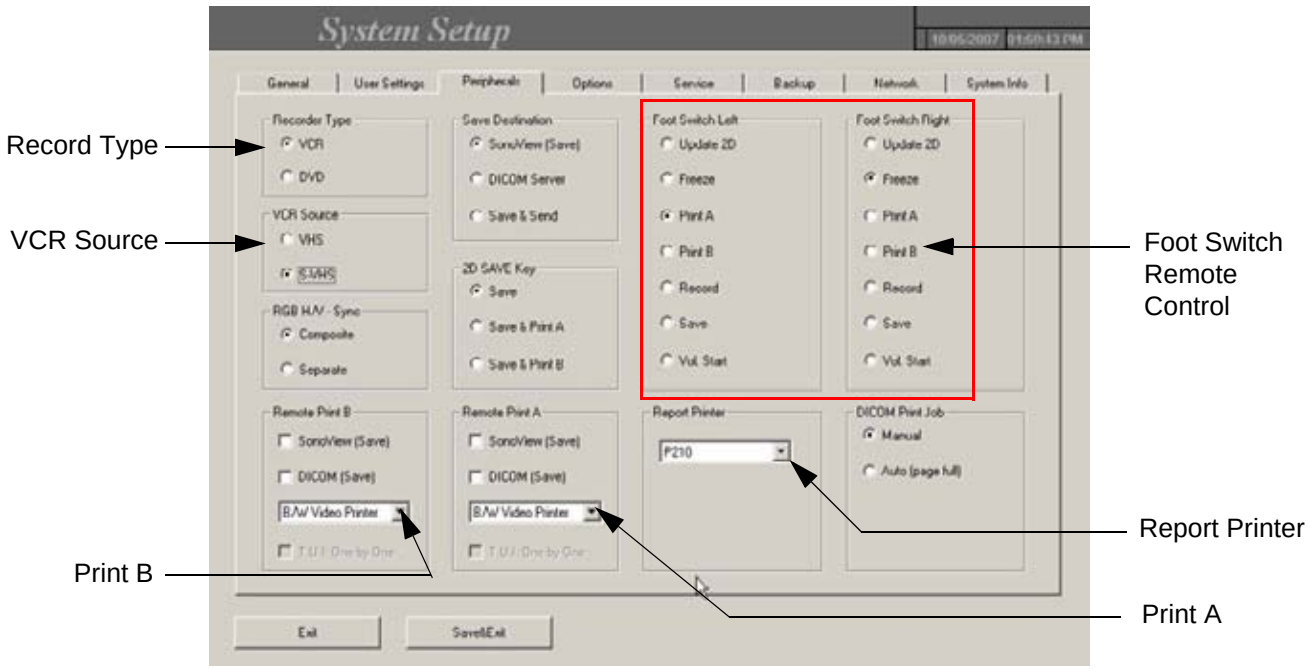


Figure 3-80 Peripherals page

- **Record Type:** Select whether you use a VCR (Video Cassette Recorder) or DVR (DVD Recorder).
- **VCR Source:** Select S-VHS.

- **Remote Print A:** Select the desired Printer for the remote control **PRINT A** key.
- **Remote Print B:** Select the desired Printer for the remote control **PRINT B** key.

NOTE: Optionally the Remote Control can be done by Foot switches.
Therefore select "Print A" or "Print B" in "Foot Switch Left" or "Foot Switch Right" - section.

- **Report Printer:** Select the desired Report Printer from the drop-down menu.

NOTICE The selected Report Printer is usually used for printing reports and images from Sonoview.

- **Foot Switch Left/Right:** Select desired function of the Foot switch Left and Right.

After adjustment, click SAVE&EXIT to save Settings and exit System Setup.

Section 3-8
System Configuration

3-8-1 System Setup

Modifications of system parameters are supported by diverse dialog pages and windows on the system setup desktop:

- **General** - Date, Time, Clinic Name, Language, Screen saver, etc.
- **User Settings** - to save User programs, 3D/4D programs, Auto Text, Doppler 2D Refresh, etc.
- **Peripherals** - to adjust assignment of **PRINT** keys, Foot Switch, selection of Save Destination, etc.
- **Option** - shows which options are installed in the system
- **Service** - enter the password to get access to the Service Tools functions
- **Backup** - Save/Load User Settings Only, Save/Load/Delete Full Backup
- **Network** - to set up all DICOM, Sonoview and Network configuration nodes
- **System Info** - shows which Software/Hardware version is installed in the system

NOTICE More detailed information pertaining System Setup adjustments is found in the Voluson® 730Pro/ProV Basic User Manual; see: Table 9-19, “System Manuals,” on page 9-31.

3-8-1-1 To invoke the Setup procedure:

1.) Press the **UTILITIES** key on the Control Panel. The menu area changes to the Utilities menu.
2.) Select the SYSTEM item to activate the setup desktop screen.

In general operations are done with the trackball and the trackball keys (mouse emulation).

Trackball (mouse position):
positions the pointing device (arrow) on the desktop

l**eft trackball key** (left mouse button):
sets, fixates markers and activates pages/buttons etc. marked by the pointing device

upper trackball key (right mouse button):
no function in system desktop

right trackball key (left mouse button):
sets, fixates markers and activates pages/buttons etc. marked by the pointing device

3-8-1-2 How to enter Date and Time

1.) Invoke System Setup as described in Section 3-8-1-1 on page 3-60.
2.) Select the GENERAL page in the System Setup desktop.

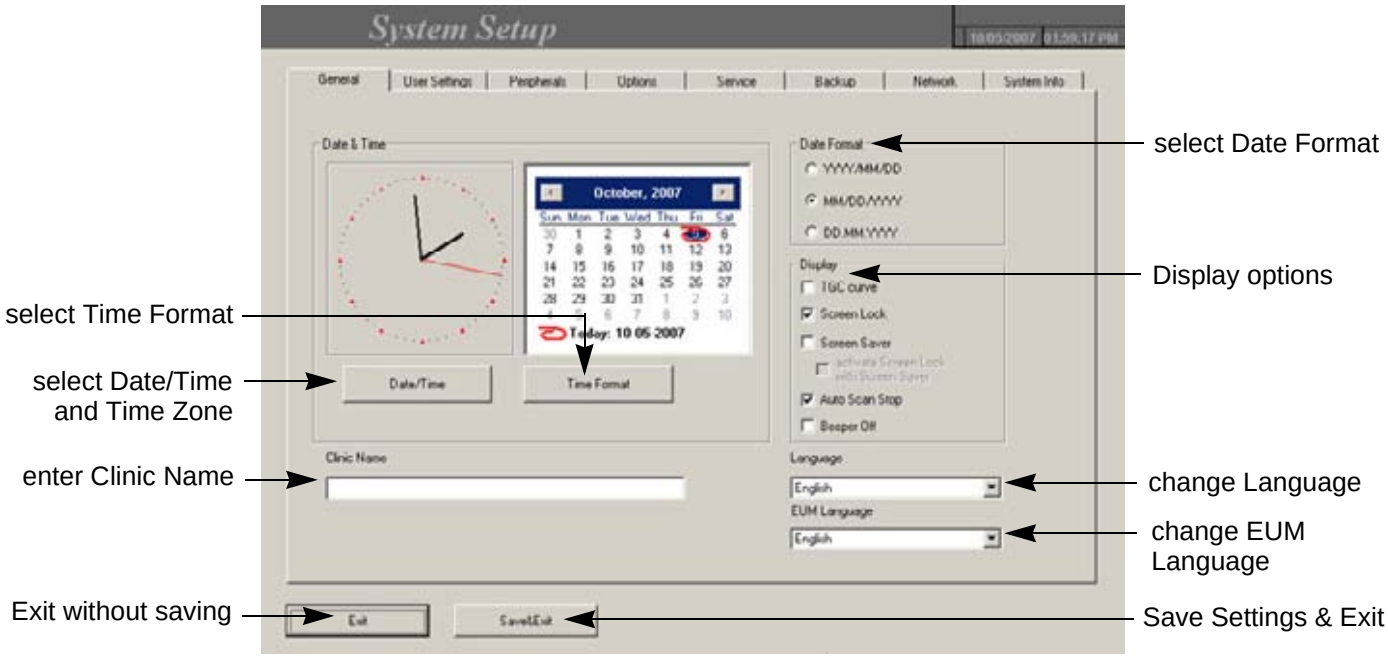


Figure 3-81 System Setup - General page

3.) Select the “Date Format” (only one can be active).
4.) Click the DATE/TIME button to activate a sub dialog window to enter date, time and time zone.
5.) Click the TIME FORMAT button to activate a sub dialog window to choose preferred time format.
6.) Click SAVE&EXIT to save Settings and exit System Setup.

3-8-1-3 How to enter Hospital Name

1.) Invoke System Setup as described in Section 3-8-1-1 on page 3-60.
2.) Select the GENERAL page in the System Setup desktop.
3.) Select the text box to enter a new “Clinic Name” with the keyboard.
4.) Click SAVE&EXIT to save Settings and exit System Setup.

The clinic name will be copied into the Hospital ID in the information header.

3-8-1-4 How to change Language and the EUM Language

1.) Invoke System Setup as described in Section 3-8-1-1 on page 3-60.
2.) Select the GENERAL page in the System Setup desktop.
3.) Select the desired language from the pop-up menu.
4.) Click SAVE&EXIT to save Settings and exit System Setup.

NOTE: After changing the language the system has to reboot.

3-8-1-5 How to activate Screen Lock

1.) Invoke System Setup as described in Section 3-8-1-1 on page 3-60.

2.) Select the GENERAL page in the System Setup desktop.

3.) Check mark “Screen Lock”.

a.) If no password previously entered, the following dialog appears.

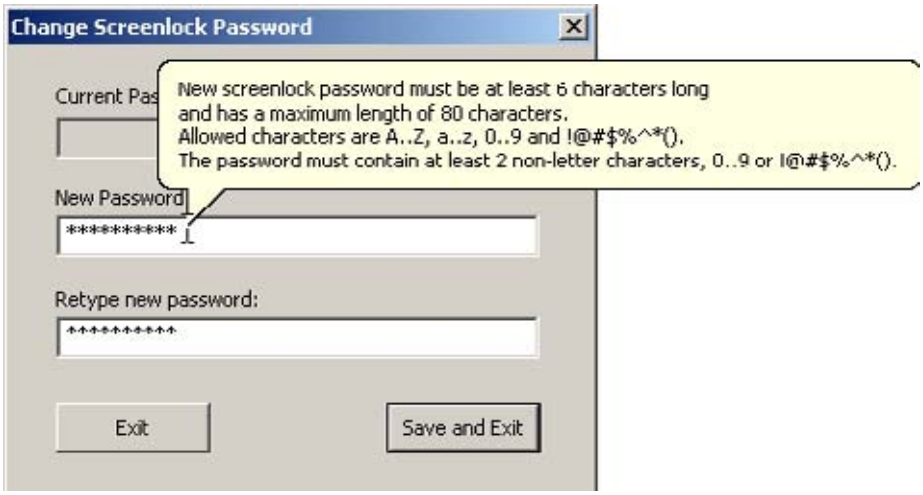

Change Screenlock Password
Current Pas
New screenlock password must be at least 6 characters long
and has a maximum length of 80 characters.
Allowed characters are A..Z, a..z, 0..9 and !@#$%^*().
The password must contain at least 2 non-letter characters, 0..9 or !@#$%^*().
New Password
****
Retype new password:
****
Exit
Save and Exit

Figure 3-82 Screenlock Password

b.) Enter “New Password”.

NOTE: A new screen lock password must be at least 6 characters long and has a maximum length of 80 characters. The password must contain at least 2 non-letter characters, 0...9 or !@#$%^*().

c.) “Retype new Password” and then click SAVE&EXIT to save new screen lock password.

4.) Click SAVE&EXIT to save Settings and exit System Setup.

NOTE: If screen is locked you have to enter the password to get full system control.

If password is unknown click EMERGENCY. This enables standard - but limited - operation.I

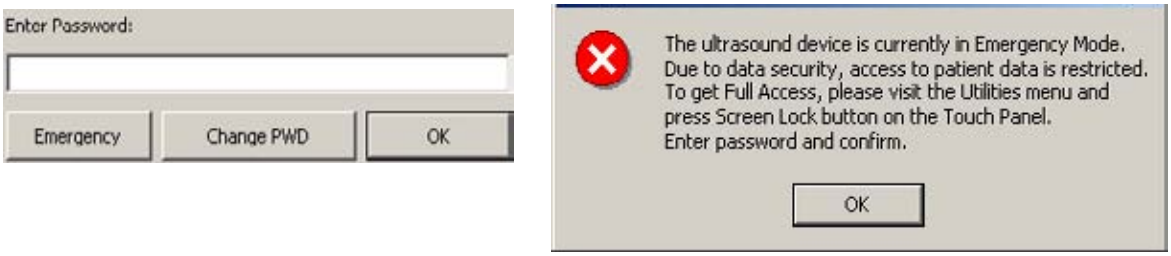

Enter Password:
Emergency
Change PWD
OK
The ultrasound device is currently in Emergency Mode.
Due to data security, access to patient data is restricted.
To get Full Access, please visit the Utilities menu and
press Screen Lock button on the Touch Panel.
Enter password and confirm.
OK

Figure 3-83 screen is locked

NOTICE The Screen Lock password cannot be reset by the user! Please contact your GE service representative.

3-8-1-6 How to change Video Norm

1.) Press the **UTILITIES** key on the Control Panel.

2.) Select the SYSTEM item from the “Utilities” menu - which is shown in the menu area on the left side of the screen - to activate the setup desktop screen.

3.) Select the **SERVICE** page in the System Setup, enter the password SHE and then click ACCEPT.

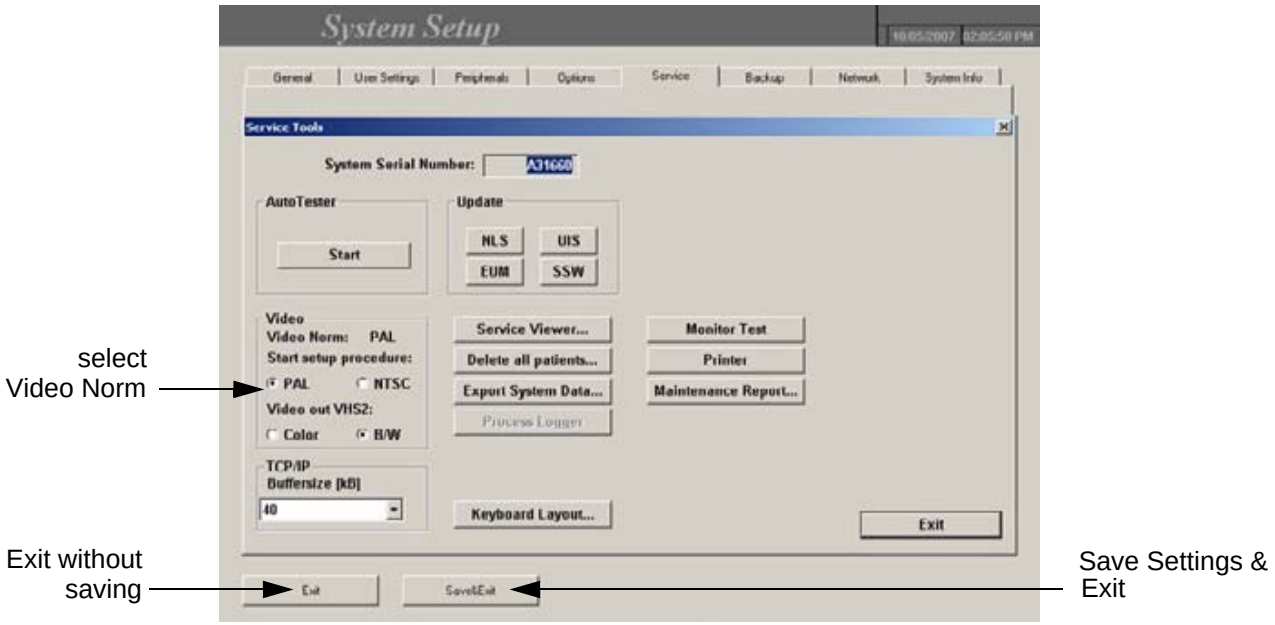


Figure 3-84 Service Functions window

4.) If not currently selected, click the desired field PAL (50Hz) or NTSC (60Hz).

NOTE: The Adjustment of the Video Norm will take about 3 minutes!

5.) Click SAVE&EXIT to exit System Setup.

6.) The system will reboot.

3-8-1-7 How to change the Keyboard Layout

see: Chapter 6 - Modification of Keyboard Layout

3-8-2 On-Board Optional Peripherals

Mains outlets: Mains socket ST1, ST2, ST3, ST4, ST5 for accessories.
All mains outlets are co-switched by the unit's mains switch via built-in isolation transformer.
Output voltage for: ST1 - ST5: 115V or 230V.

CAUTION **Modification of voltage setting only by an authorized service person!**
The maximum power consumption of equipment (inclusive color video monitor) connected to these outlets must not exceed 350VA !

Table 3-8 Approved Peripherals

Device	Manufacturer	Model	Video Signal/ Connection
B/W Video Printer	SONY	**UP-895MD**	NTSC/PAL
Digital B/W Video Printer	SONY	UP-D897	USB-Port
Digital Color Printer	SONY	UP-D21MD	USB-Port
	SONY	UP-D23MD	USB-Port
Video Cassette Recorder	SONY	SVO-9500MD SVO-9500-MDP	NTSC PAL
	Mitsubishi	HS-MD3000U HS-MD3000E	NTSC PAL
Line Printer	Hewlett Packard	hp deskjet 990cxi	USB-Port
	Hewlett Packard	hp deskjet 995c	USB-Port
Color Deskjet Printer (Bluetooth)	Hewlett Packard	HP 5600 Series	USB-Port (Bluetooth)
	Olivetti	Olivetti Job Jet 210	USB-Port (Bluetooth)
	Hewlett Packard	HP 5940	USB-Port (Bluetooth)
	Canon	Pixma MP600/MP610	USB-Port (Bluetooth)
	Canon	Pixma MP550	USB-Port (Bluetooth)
Magneto-Optical Drive (MOD)	Fujitsu	MCM3130AP	
Global Modem	Multi-Tech	MT5634ZBA	
ECG Preamplifier		MAN6	
Footswitch		MFT7	
DVD Recorder	Sony	DVO-1000MD	PAL/NTSC
19" LCD Secondary Monitor	DELL	1907FP/1908FP	

3-8-3 External I/O Connection Panel (GES)

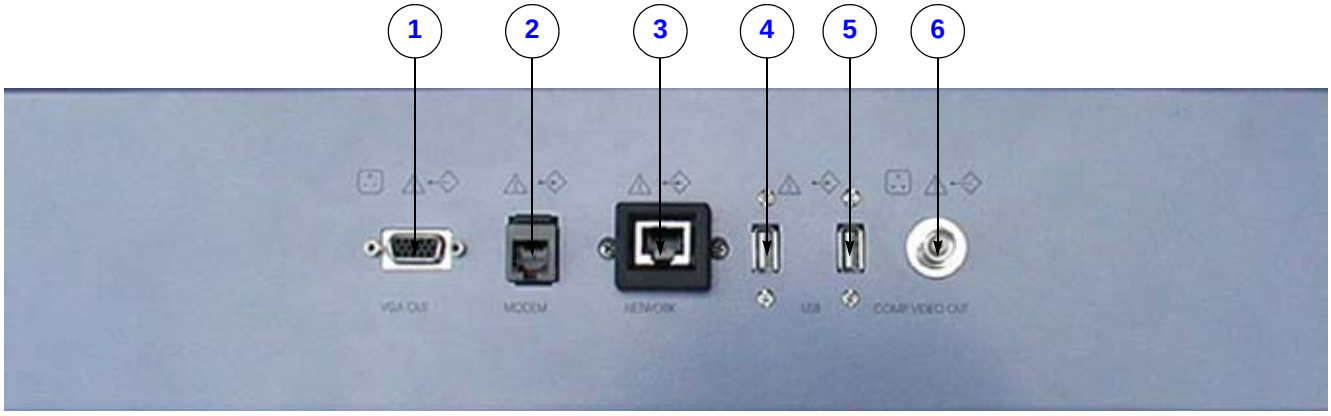


Figure 3-85 External I/O Panel Connectors

Table 3-9 External I/O Connector Descriptions

Item	Connector Name	Table Number	Description		
1	VGA OUT	Table 3-10	print out VGA signal with monitor/printer		
2	MODEM	Table 3-11	RJ-11 with global adapter kit for modem connection		
3	NETWORK	Table 3-12	DICOM input/output twisted pair RJ-45 10/100 megabit/s		
4	USB-1	Table 3-13	USB port		
5	USB-2	Table 3-13	USB port		
6	COMP VIDEO OUT	Table 3-14	BNC Connector, Color Video Output		

3-8-3-1 External I/O Pin Outs

Table 3-10 VGA OUT Connector, Sub-D 15 Pin

Pin No	Output Signal	Description
1	VGA OUT1 R	Red
2	VGA OUT1 G	Green
3	VGA OUT1 B	Blue
4, 9,11,12,15	N/C	N/C
5, 6, 7, 8, 10	GND	GND
13	VGA OUT1 HS	H Sync
14	VGA OUT1 VS	V Sync

Table 3-11 Modem, RJ-11 Modular 6 Pin

Pin No	Output Signal	Description
2	TEL L4	Telephone L4
3	TEL L2	Telephone L2
4	TEL L1	Telephone L1
5	TEL L3	Telephone L3
Others	NC	Non-connection

Table 3-12 Network Connector, RJ45 Modular 8 Pin

Pin No	Output Signal	Description
1	ETHER TD	Ethernet RD+
2	ETHER TD	Ethernet RD-
3	ETHER RD	Ethernet TD+
6	ETHER RD	Ethernet TD-
Others	NC	Non-connection

Table 3-13 USB 1, 2 Connectors

Pin No	Output Signal	Description
1	VCC	USB Power Supply
2	- Data	USB Data (-)
3	+ Data	USB Data (+)
4	GND	USB Power Ground

Table 3-14 COMP VIDEO OUT Connector

Pin No	Signal	Description
1 (Center Pin)	Signal	
2 (Coax Pin)	Signal GND	

Table 3-15 Footswitch Connector (located at Power Supply Module CPN - rear side)

Pin No	Input Signal	Description
1	Signal GND	
2	right switch	normally open
3	left switch	normally open
4	not connected	not connected

3-8-4 Video Specification

Video specifications may be needed to be able to connect laser cameras or other devices to the Voluson® 730Pro/ProV.

Table 3-16 Video Specifications VGA Connector

Timing Parameter	Value
Visible Resolution	800 x 600
Horizontal Rate [kHz]	47.20
H Total cycle time [µs]	21.20
H Sync width [µs]	1.50
H Back Porch [µs]	2.94
H Active Video Time [µs]	16.15
H Front Porch [µs]	0.616
Horizontal +/-	pos
Vertical Rate [Hz]	75.00
Vertical Total cycle time [ms]	13.30
V Sync Width [ms]	0.170
V Back Porch [ms]	0.276
V Active Video Time [ms]	12.68
V Front Porch [ms]	0.174
Dot Clock [MHz]	49.54

3-8-4 Video Specification (cont'd)

Electrical Specifications on VGA Connector

- Signal Level: 700 mV at 75 Ohm
- H/V Sync: TTL Level

Table 3-17 Video Specifications for Composite, Video Connector

S-Video Output set to: Timing Parameter	PAL 50Hz	NTSC 60Hz
Visible Resolution	800 x 600	800 x 600
Pixel Clock	17.734475 MHz = 4* ft	14.318 MHz = 4* ft
Horizontal Total Line	64µs / 1135 Pixel	63.56µs / 910 Pixel
Horizontal Active Display	50.50µs / 902 Pixel	52.50µs / 752 Pixel
Horizontal Front Porch	1.96µs / 35 Pixel	1.62µs / 23 Pixel
Horizontal Sync Width	4.62µs / 82 Pixel	4.68µs / 67 Pixel
Horizontal Back Porch	6.52µs / 116 Pixel	4.76µs / 68 Pixel
Vertical Total Lines	20ms / 312.50 Lines	16.68ms / 262.50 Lines
Vertical Active Lines	18.18ms / 284 Lines	15.22ms / 239.50 Lines
Vertical Front Porch	256us 4 Lines	381us / 6 Lines
Vertical Sync	160us / 2.50 Lines	190us 7 3 Lines
Vertical Back Porch	1408us / 22 Lines	890us / 14 Lines
Serration Pulses	5	6
Interlaced	yes	yes
Aspect Ratio pixel size	14.75 (H) : 17.734475 (V)	14.75 (H) : 14.318 (V)
Video levels on 75 Ohm:		
white level	1020mV	1020mV
black level	370mV	370mV
blanking level	320mV	320mV
sync level*	20mV	20mV

Section 3-9
Available Probes

See *Chapter 9 - System Manuals*, for part numbers to be used when ordering new or replacement service probes.

Section 3-10
Software/Option Configuration

For description refer to:

- Section 3-8-1 "System Setup" on page 3-60

NOTICE More detailed information pertaining System Setup and Measure Setup adjustments is found in the Voluson® 730Pro/ProV Basic User Manual, which is available in different languages.

Section 3-11
Network IP Address Configuration

NOTE: Following Information must be provided by customer or hospital engineer before you can start:
A Station name, AE Title, IP address and Port Number for the Voluson® 730Pro/ProV.
The IP addresses for the default gateway and other routers at the site for ROUTING INFORMATION.
Only if necessary (e.g. for Internet access).

1.) Press the **UTILITIES** key on the Control panel once to display the Utilities menu.
2.) Select SYSTEM and then open the NETWORK page on the System Setup desktop screen.
3.) Click the NETWORK CONFIGURATION button, read the message and confirm with YES.

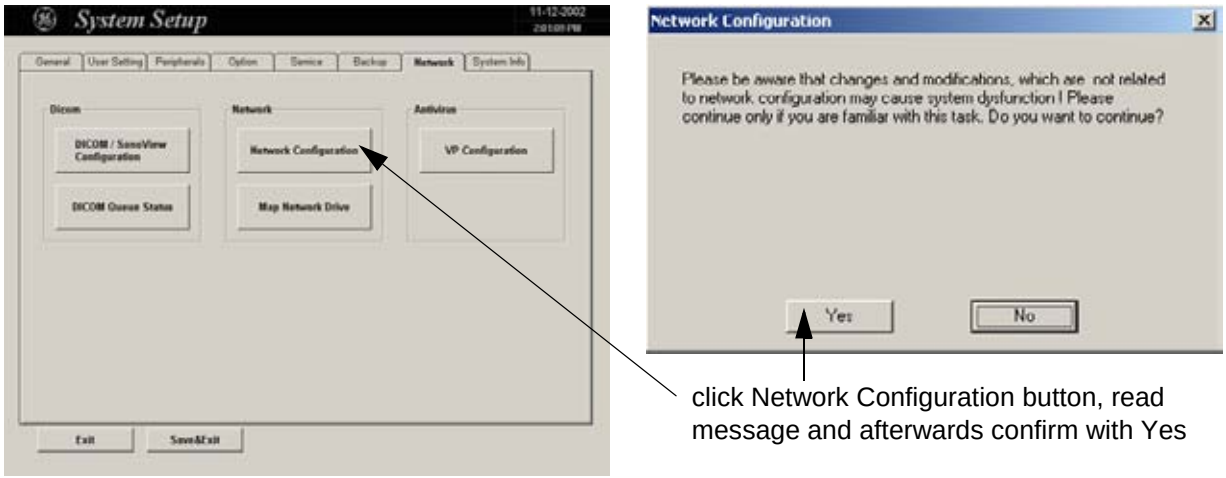

System Setup
Network Configuration
Please be aware that changes and modifications, which are not related to network configuration may cause system dysfunction ! Please continue only if you are familiar with this task. Do you want to continue?
Yes
No
click Network Configuration button, read message and afterwards confirm with Yes

Figure 3-86 Network Configuration

4.) The “Internet Protocol (TCP/IP) Properties” dialog page appears.

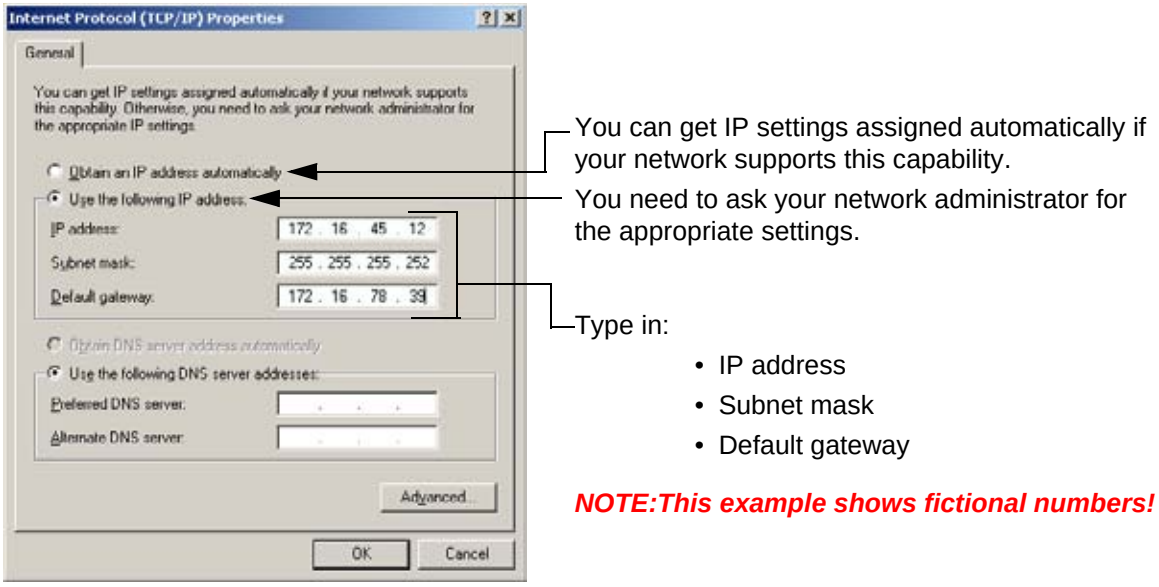

Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 172 . 16 . 45 . 12
Subnet mask: 255 . 255 . 255 . 252
Default gateway: 172 . 16 . 78 . 39
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel
You can get IP settings assigned automatically if your network supports this capability.
You need to ask your network administrator for the appropriate settings.
Type in:
• IP address
• Subnet mask
• Default gateway
NOTE:This example shows fictional numbers!

Figure 3-87 Internet Protocol (TCP/IP)

To specify a DICOM Address, follow the instructions of described in the Basic User Manual, Chapter 17 of the Voluson® 730Pro/ProV.

3-11-1 Map Network Drive

1.) Select the MAP NETWORK DRIVE button (in the System Setup - **Network** page, see: Figure 3-86) to open a dialog where the system can be connected to a shared network drive of another server.

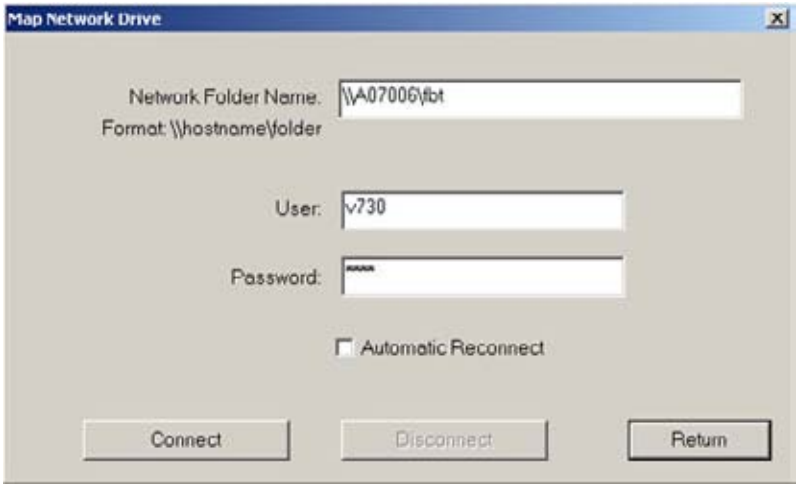


Figure 3-88 Map Network Drive window

2.) Enter the name of the shared network folder in the „Network Folder Name“ field.

3.) Supply a valid user name and a password for this folder.

NOTE: If you check the „Automatic Reconnect“ box, the system tries to establish the connection again when starting up.
Otherwise, the connection must be re-established manually after a shutdown or reboot.

4.) Select the CONNECT button to establish the connection to the remote machine.
If successful, the DISCONNECT button becomes active.

NOTICE If there is an error during the connection, a warning message appears inside the dialog.
In this case, please verify the data in the dialog.

NOTICE If there already is a connection to the remote server, the CONNECT button is grayed.
To change the existing connection, first click on DISCONNECT and then enter the new settings.

WARNING ***Please make sure that the server you are connecting to is trustworthy and reliable. For details, contact your local system administrator.***
If you backup Sonoview data to this server, all the patients' demographic data will be copied to this server!

Section 3-12
Connectivity Setup Worksheet

Site System Information

Site:

Dept:

Serial #:

Type:

Floor:

Room:

REV:

Comments:

CONTACT INFORMATION

Name	Title	Phone	E-Mail Address

TCP/IP Settings

Name - AE Title:

IP Settings

IP Address:

Subnet Mask:

Default Gateway:

Remote Archive Setup

Remote Archive IP:

Remote Archive Name:

Services (Destination Devices)

	Device Type	Manufacturer	Name	IP Address	Port	AE Title
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Section 3-12 Connectivity Setup Worksheet (cont'd)

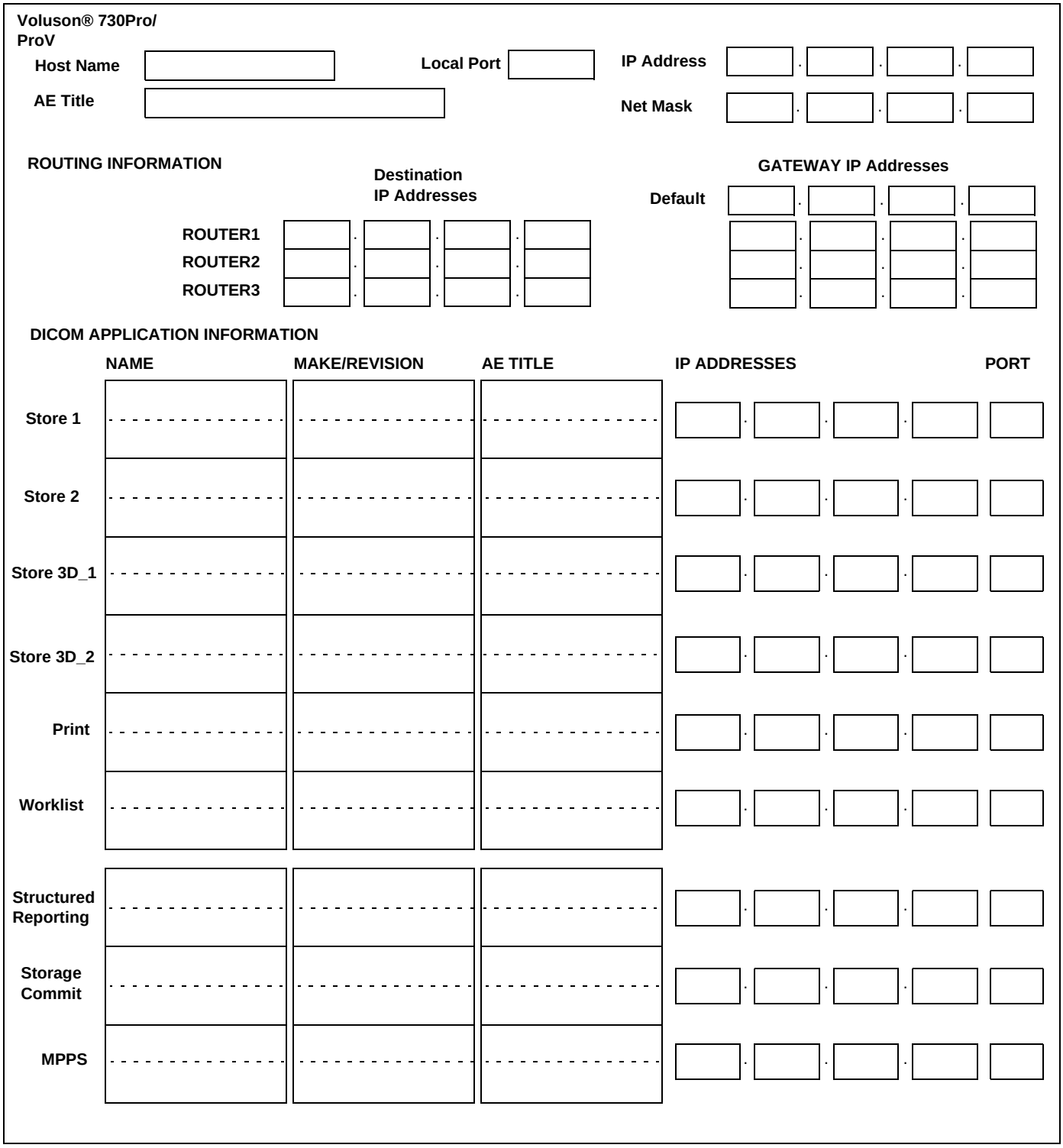


Figure 3-89 Worksheet for DICOM Network Information

Section 3-13
Paperwork

NOTE: During and after installation, the documentation (i.e. User Manual, Installation Manual,...) for the peripheral units must be kept as part of the original system documentation. This will ensure that all relevant safety and user information is available during the operation and service of the complete system.

3-13-1 Product Locator Installation

NOTE: The Product Locator Installation Card shown may not be same as the provided Product Locator card.

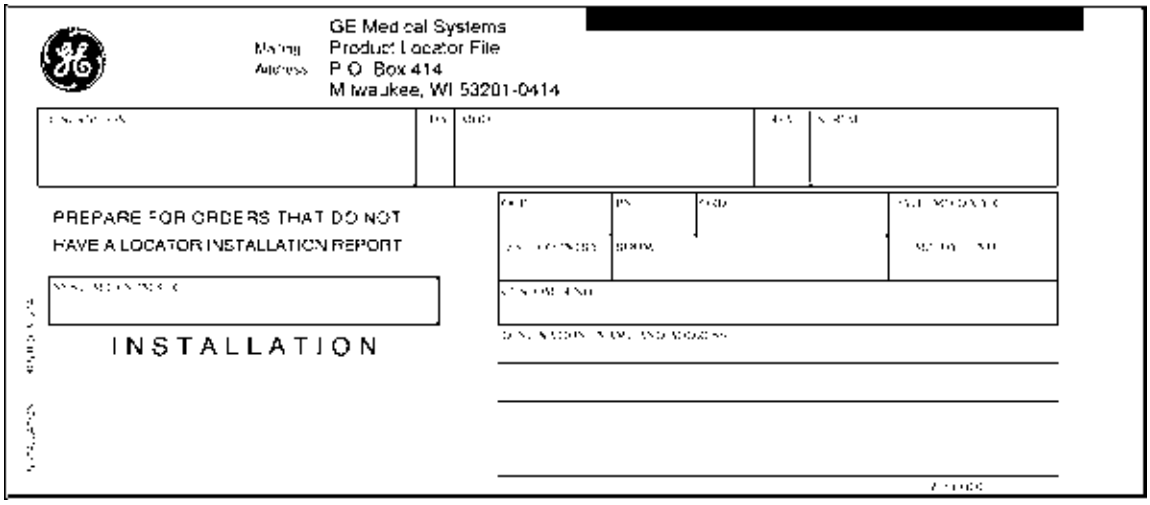


Figure 3-1 Product Locator Installation Card

3-13-2 User Manual(s)

Check that the correct User Manual(s) for the system and software revision, is included with the installation. Specific language versions of the User Manual may also be available.
Check with your GE Sales Representative for availability.

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Chapter 4
Functional Checks

Section 4-1
Overview

4-1-1 Purpose of Chapter 4

This chapter provides procedures for quickly checking major functions of the Voluson® 730Pro/ProV scanner diagnostics by using the built-in service software, and power supply adjustments.

Table 4-1 Contents in Chapter 4

Section	Description	Page Number
4-1	Overview	4-1
4-2	Required Equipment	4-1
4-3	General Procedure	4-2
4-4	Functional Checks	4-7
4-5	Backup and Restore Database, Preset Configurations and Images	4-32
4-6	Software Configuration Checks	4-42
4-7	Peripheral Checks	4-43
4-8	Mechanical Function Checks	4-44
4-9	Site Log	4-45

NOTICE Most of the information pertaining to this Functional Checks chapter is found in the Voluson® 730Pro/ProV (BT05, BT08) Basic User Manual; see: Table 9-19, “System Manuals,” on page 9-31.

Section 4-2
Required Equipment

- An empty (blank) DVD/CD+(R)W or MO Disk.
- At least one transducer. See *”System Manuals” on page 9-31* for an overview.
  (normally you should check all the transducers used on the system)

Section 4-3
General Procedure

CAUTION **SYSTEM REQUIRES ALL COVERS**
Operate this unit only when all board covers and frame panels are securely in place.
The covers are required for safe operation, good system performance and cooling purposes.

NOTICE Lockout/Tagout Requirements (For USA only)

Follow OSHA Lockout/Tagout requirements by ensuring you are in total control of the Power Cable on the system.

4-3-1 Power On / Boot Up

NOTICE After turning off a system, wait at least 10 seconds before turning it on again.
The system may not be able to boot if power is recycled too quickly.

4-3-1-1 Scanner Power On

1.) Connect the Power Cable to the back of the system.
2.) Screw on the pull-out protection of the mains power cable with the 2 screws.
3.) Connect the Power Cable to an appropriate mains power outlet.
4.) Switch ON the Circuit Breaker at the rear of the system.

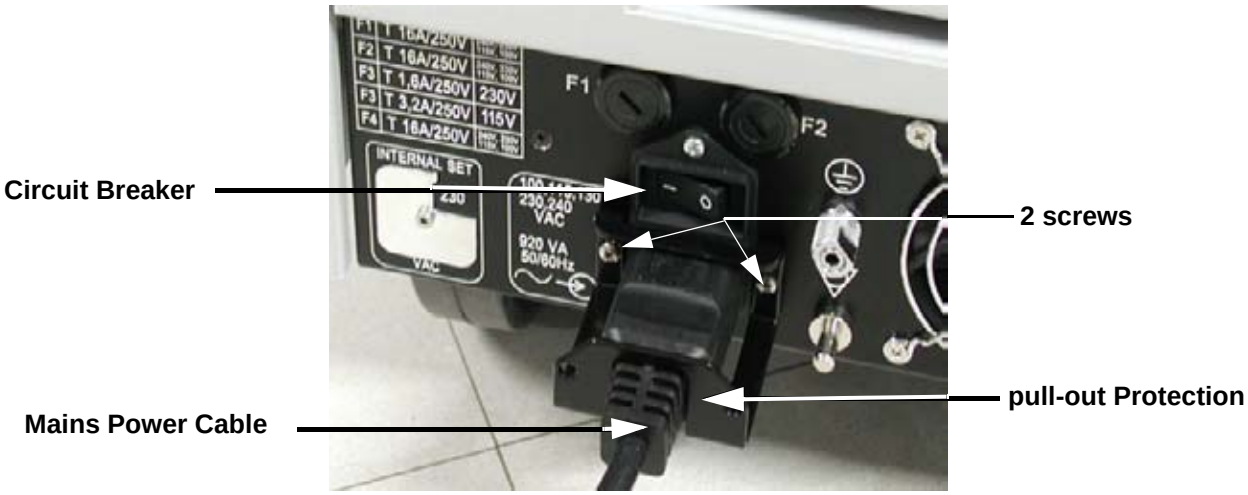


Figure 4-1 Circuit Breaker, Protection and Power Cable on back of Voluson® 730Pro/ProV

NOTICE When AC power is applied to the scanner, the **ON/OFF** switch on the Control panel illuminates amber, indicating the System (including the Back-end Processor) is in standby mode.

4-3-1-1 Scanner Power On (cont'd)

5.) Press the **ON/OFF** Standby switch left below the control panel.

Figure 4-2 ON/OFF Standby Switch

NOTE: The mains outlet of the system for peripheral auxiliary equipment are commonly switched with the Standby switch. So the auxiliary equipment need not to be switched ON/OFF separately.

When the **ON/OFF** Stand-By switch left below the control panel is pressed, the System (including the Back-end Processor) starts and the software code is distributed to initiate the scanner.

As soon as the software has been loaded, the system enters 2D-Mode with the probe and application that were used before the system was shut down. Depending on the BIOS-Version no status messages are displayed during this process. Boot up time is about 2 minutes.

4-3-2 Power Off / Shutdown

NOTICE After turning off a system, wait at least ten seconds before turning it on again. The system may not be able to boot if power is recycled too quickly.

4-3-2-1 Scanner Shutdown

1.) Press the **ON/OFF** Standby switch left below the Control Panel.

2.) Switch OFF the Circuit Breaker at the rear of the system.

NOTE: The mains outlet of the system for peripheral auxiliary equipment are commonly switched with the Standby switch. So the auxiliary equipment need not to be switched ON/OFF separately.

WARNING ***Disconnection of the Main Power Cable is necessary! For Example: When repairing the system.***

3.) After complete power down, unscrew the 2 screws and remove the pull-out protection to disconnect the main power cable from the system or unplug it from the AC wall outlet socket. Refer to Figure 4-1 on page 4-2.

4.) Press once on the brakes to block the front wheels (brakes on front wheels under the foot rest).

5.) Disconnect probes. (Turn the probe locking handle counterclockwise and then pull the connector straight out of the probe port.)

CAUTION **DO NOT disconnect a probe while running (Live Scan "Write" mode)! A software error may occur. In this case switch the unit OFF (perform a reset).**

4-3-3 System Features

4-3-3-1 Control Panel

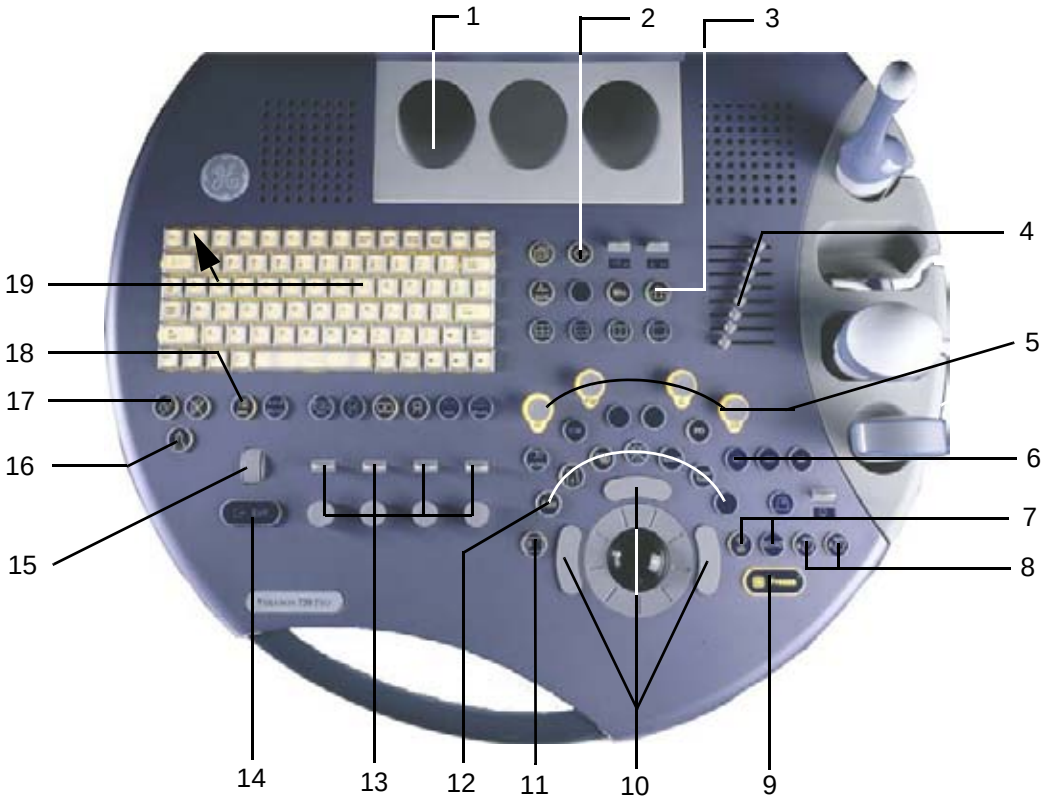


Figure 4-3 Control Panel Tour

1.) Ultrasound scanning gel holder
2.) Sonoview (Image Management) key
3.) VCR Remote Control key
4.) TGC - Slider Controls
5.) Mode/Gain keys
6.) 3D Volume Mode, 4D Volume Mode and Harmonic Imaging key
7.) Inter memory keys to save to Sonoview or send to DICOM server
8.) Print A-, Print B-Trigger key
9.) Freeze / Run key
10.) Trackball and Trackball keys
11.) Trackball Menu Navigation key
12.) Annotation and Measurement keys
13.) Menu Control digipots and toggle switch controls
14.) Exit key
15.) Navigation wheel (Menu control element)
16.) Probe key
17.) Patient Data Entry key
18.) Utilities key
19.) Keyboard with shortcut function keys and F1 key to invoke the Electronic User Manual (EUM)

4-3-3-2 Menu Control

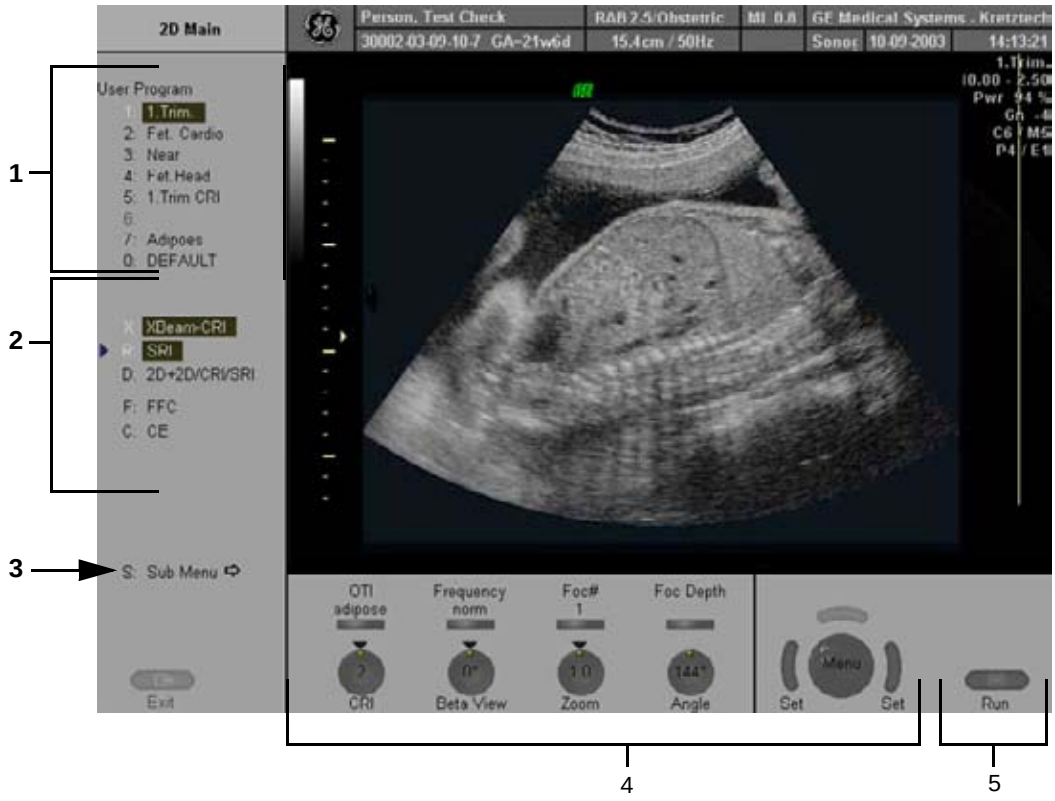


Figure 4-4 Menu Control Area- 2D Main Menu

1.) User Program: shows all setting for the active application. The active one is highlighted
2.) Additional functions which are supported by the selected Mode.
3.) Sub Menu: to adjust settings of the selected Scan mode.
4.) Status Area: shows the current functionality of the digipots, toggle switch controls and the trackball
5.) Status of the **FREEZE** key

NOTE: Different menus are displayed depending on which Menu and which Mode is selected.

DIGIPOTS, TOGGLE SWITCH CONTROLS and TRACKBALL

Activated functions are easily controlled by these controls. By rotating resp. switching, they deliver digital pulses and can be selected by program call-up.
They are displayed in the status area by their location, their function, and their actual value of setting.

NAVIGATION WHEEL and corresponding KEYBOARD-SHORTCUT FUNCTIONS

The available menus are shown in the menu area on the left side of the screen. The current menu selection is highlighted. Roll the navigation wheel and the blue arrow moves to another selection. Press the navigation wheel to select the desired item.The corresponding keyboard shortcuts (1, 2, 3, etc.) are shown to the right of the actual function.

If the **TRACKBALL MENU NAVIGATION** key is illuminated, the trackball is consequently assigned to select the menu items in the menu area on the left side of the screen.
Pressing **SET** (the left or right trackball key) starts selected menu function.

4-3-3-3 Monitor Display

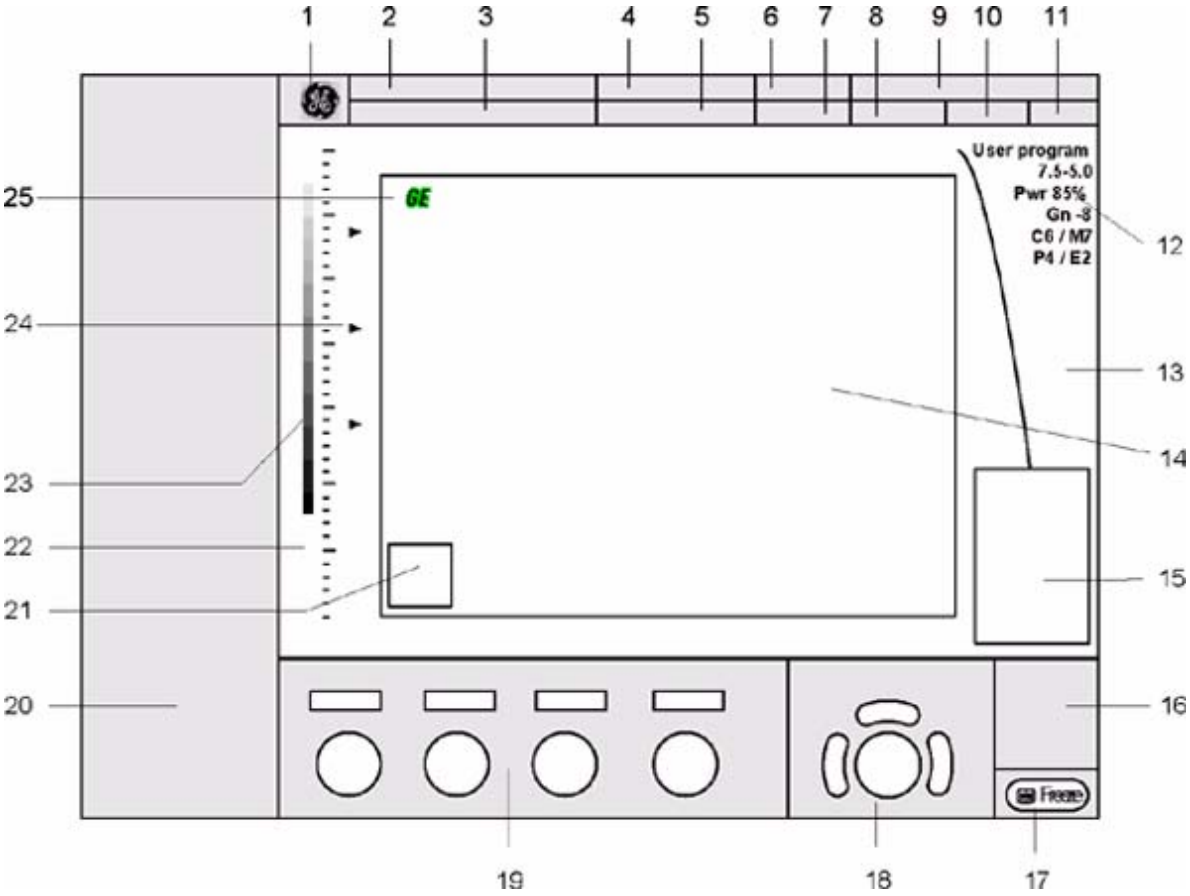


Figure 4-5 Monitor Display Tour

Table 4-2 Monitor Display Features

1. Logo	14. Image Area
2. Patient Name (Last-, First-, Middle Name)	15. Measurement results
3. Patient ID-number ; GA (Gestational Age)	16. Status (volume box, saved images, gray map)
4. Probe / Application	17. Status area of the Freeze key
5. Depth / Frame rate	18. Status area of the trackball
6. Mechanical Index	19. Status area of digipots and flip switch controls
7. Thermal Index	20. Menu (Softkey) area
8. Sonographers Name	21. Bodymarks
9. Hospital Name (Identification)	22. Depth scale markers
10. Date	23. Gray scale wedge
11. Time	24. Focal zone marker(s)
12. Image Info	25. Orientation marker
13. TGC curve	

Section 4-4
Functional Checks

For a basic functional check of the system's different modes, following pages will familiarize you with image optimization for:

- 2D Mode (B Mode), see: Section 4-4-1 on page 4-8
- M Mode, see: Section 4-4-2 on page 4-11
  - MCFM Mode
  - MTD Mode
- Spectral Doppler Modes, see: Section 4-4-3 on page 4-13
  - PW - Pulsed Wave Doppler
  - CW - Continuous Wave Doppler
- Color Doppler Modes, see: Section 4-4-4 on page 4-15
  - CFM - Color Flow Mode
  - PD - Power Doppler
  - TD - Tissue Doppler
- Volume Modes, see: Section 4-4-5 on page 4-17
  - 3D Static
  - 4D Real Time
  - 4D Biopsy*
  - VCI* Volume Contrast Imaging (A-Plane, C-Plane and VCI Static)
  - STIC*
  - T.U.I.* (Tomographic Ultrasound Imaging)
  - VOCAL II*

NOTE: *Some software may be considered standard depending upon system configuration. If any Modes or Options are not part of the system configuration, the check can be omitted.*

NOTE: *Different menus are displayed depending on which Menu and which Mode is selected. Some function only appear in the menu area and the status area of the digipots and flip switch controls if they are available for the selected Probe.*

NOTICE Not all Options are available on the Voluson® 730Pro V (marked with * in this manual).

4-4-1 2D Mode Checks

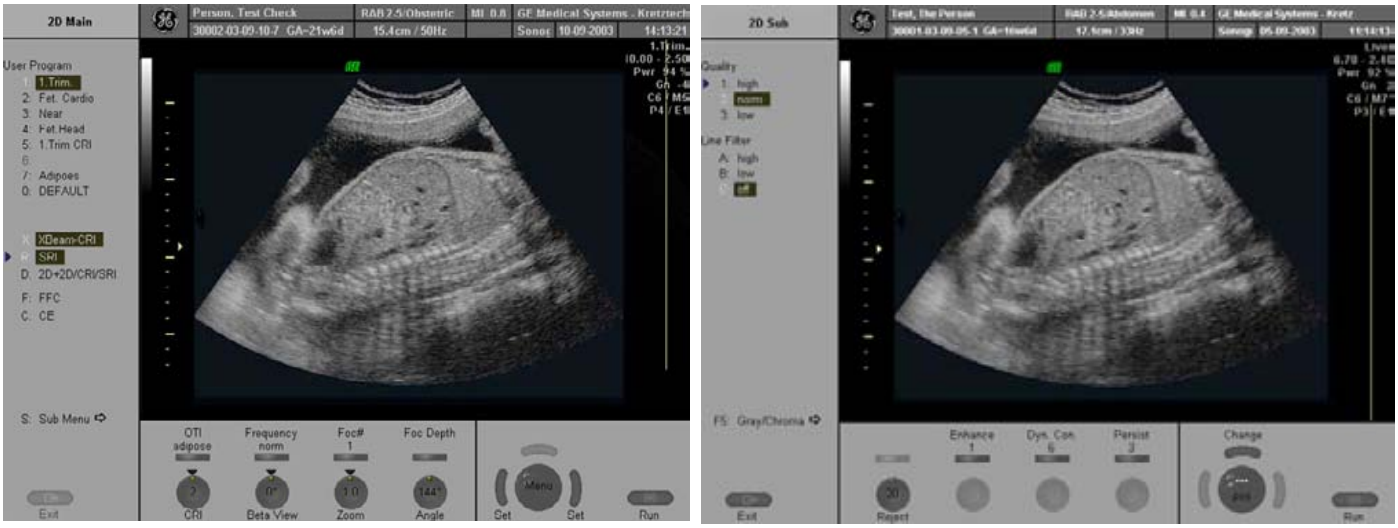


Figure 4-6 2D Main and 2D Sub

Table 4-3 2D Mode Functions

Step	Task	Expected Results
1	2D Mode Gain	Rotate the **2D MODE** key to adjust the sensitivity (brightness) of the entire image.
2	Transmit Power	Optimizes image quality and allows user to reduce beam intensity.
3	Depth	Adjusts the depth range of the ultrasound image for the region of interest. The number of image lines and the frame rate are automatically optimized.
4	Screen Format (Dual, Quad, Single)	Press this keys to change the display Mode from Single to **DUAL** or **QUAD** display mode. Press the **SINGLE** format key or the **2D MODE** key to change from Dual or Quad to Single display.
5	Image Orientation	Use the **LEFT/RIGHT** respectively the **UP/DOWN** keys on the control panel to alternate the image orientation. The orientation marker on the screen shows the actual orientation.
6	2D Automatic Optimization	Pressing the **AUTO** key causes automatic optimization of the gray scale to enhance the contrast resolution. Pressing again: optimization will be updated and remain active. Press the **AUTO** key twice to switch off the Automatic Optimization in 2D.
7	XBEAM-CRI (CrossBeam Compound Resolution Imaging)	Pulses are transmitted not only perpendicularly to the acoustic window, but also in oblique directions. The advantages of XBeam-CRI are enhanced contrast resolution with better tissue differentiation and clear organ borders.

Table 4-3 2D Mode Functions

Step	Task	Expected Results
8	SRI * (Speckle Reduction Imaging)	Speckle Reduction Imaging is a smoothing type filter to reduce speckle in the ultrasound image.
9	2D+2D/SRI *	Changes the Single image display to two simultaneous half images. The left frame shows only the 2D Mode image. The right frame shows the 2D Mode image with SRI information.
10	2D+2D/CRI/SRI *	Changes the Single image display to two simultaneous half images. The left frame shows only the 2D Mode image. The right frame shows the 2D Mode image with XBEAM CRI and SRI information.
11	FFC (Focus and Frequency Composite)	FFC combines a low frequency to increase the penetration and higher frequency to keep a high resolution. It reduces speckle and artifacts in the 2D image.
12	CE (Coded Excitation)	Coded Excitation improves image resolution and penetration in the far field. This allows to use a higher frequency on technically difficult patients.
13	LINEAR / TRAPEZOID	Advantage of the Trapezoid Mode: The scan area is very increased in relation to the linear display by steering the ultrasound lines in the border of the probe.
14	High Resolution Zoom	Press this key in write mode. The displayed zoom box can be placed over the entire 2D image area, also the size and position of the zoom box can be changed. Press the **HR-ZOOM** key again to activate the zoom and again to exit the High Resolution Zoom function.
15	Harmonic Imaging	Press the **HI** key on the control panel to switch on/off the Coded Harmonic Imaging function in 2D Mode provided the active probe allows this function.
16	XTD View	Press the **BX** key on the control panel to activate or deactivate the XTD-View mode. A blue box is displayes at the border of the 2D image. Start and Stop the XTD-image acquisition with the **RIGHT TRACKBALL KEY**.
17	**FREQUENCY** resp. **HARM.FREQU.** in case of Harm. Imaging	To adjust the range of the receive frequency. high resolution / lower penetration, mid resolution / mid penetration, or lower resolution / high penetration
18	**OTI** (Otimized Tissue Imaging)	OTI™ allows to “fine tune” the system for scanning different kinds of tissue.
19	**FOC #**	Increases the number of transmit focal zone, so that you can tighten up the beam for a specific area.
20	**FOC DEPTH**	To select the depth position of the actual focus zone(s). Arrows at the left edge of the 2D image mark the active focal zone(s) by their depth position.
21	**ANGLE**	Use this control to select a part of interest of the 2D image. The advantage of the decreased field-of-view is an increased 2D frame rate due to the smaller sector width.
22	**BETA VIEW**	This function allows the adjustment of the Volume O-Axis position of 3D probes in 2D Mode. The green line in the displayed symbol indicates the position of the acoustic block.
23	**ZOOM**	Image magnification (Pan Zoom) in read-/ and write mode.
24	QUALITY	Control to improve the resolution by reducing the frame rate. Respectively reducing the resolution by increasing the image frame rate.

Table 4-3 2D Mode Functions

Step	Task	Expected Results
25	LINE FILTER	The signals of the neighboring pulses are less weighted for the display of the actual pulse which considerably improves the detail lateral resolution and signal-to-noise ratio. This function is only available if CRI is switched off.
26	**ENHANCE**	Enhance brings out subtle tissue differences and boundaries by enhancing the gray scale differences corresponding to the edges of structures. Adjustments to M Mode's edge enhancement affects the M Mode only.
27	**DYN.CON.**	Dynamic Range controls how echo intensities are converted to shades of gray, thereby increasing the adjustable range of contrast.
28	**PERSIST**.	Persistence is a temporal filter that averages frames together. This has the effect of presenting a smoother, softer image. This function is only available if CRI is switched off.
29	**CRI ENHANCE** *	If this filter is set to “high”, the XBeam-CRI image is smoothed. CRI Enhance setting “off” leads to a sharper impression of the XBeam-CRI image. This function is only available if X-BEAMCRI is switched on.
30	**REJECT**	Selects a level below which echoes will not be amplified (an echo must have a certain minimum amplitude before it will be processed).
31	**EXIT**	Press the **EXIT** key on the control panel to exit the 2D Sub menu.

For further details refer to the Voluson® 730Pro/ProV Basic User Manual, Chapter 5, 2D Mode.

4-4-2 M Mode Checks

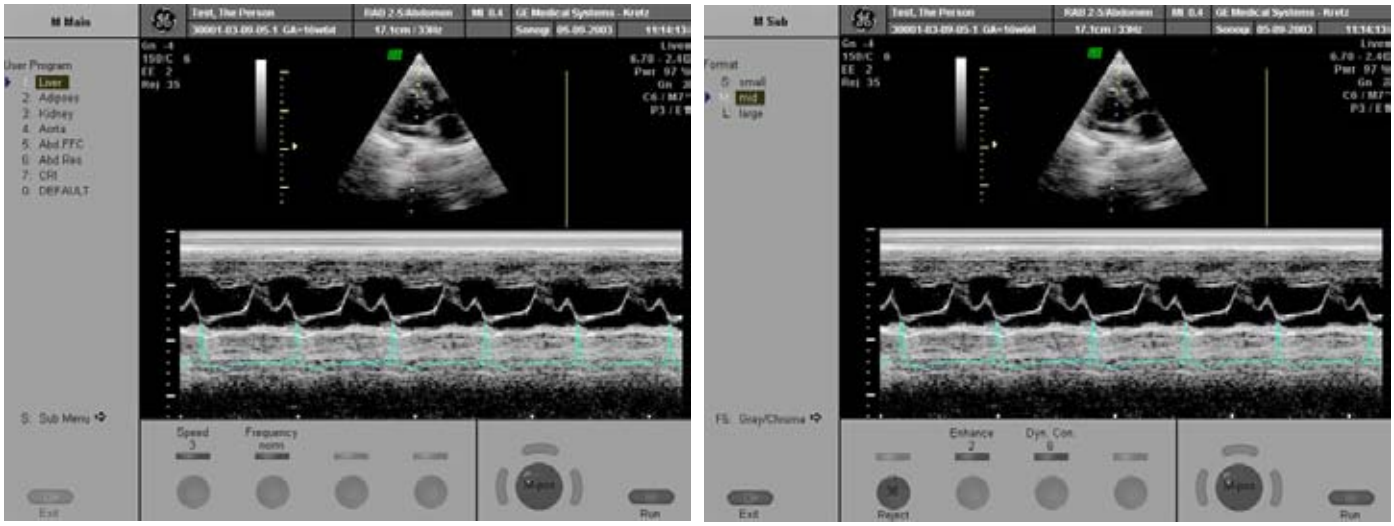
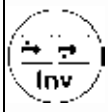
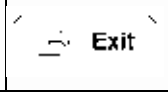


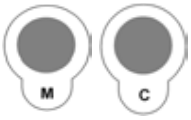
Figure 4-7 M Main and M Sub

Table 4-4 M Mode Functions

Step	Task	Expected Results
1	Cursor Position	Adjust the M Cursor position with the **TRACKBALL** in the 2D Single image.
2	Activation of M Mode	Press the **right or left trackball key** to activate both Modes (2D/M).
3	M Mode Gain	Rotate the **M MODE** key to adjust the sensitivity (brightness) of the entire M image.
4	M Mode Depth	Common with 2D Mode Depth.
5	Invert 	This function inverts the M mode trace from up to down in the M mode display area. (The Invert function is only available with endovaginal probes.)
6	**SPEED**	By touching up or down, four different sweep speeds can be selected.
7	**FREQUENCY**	Common with 2D Mode Frequency resp. Harm.Frequ. in case of Harm. Imaging.
8	FORMAT	For selection of three different rations of display format.
9	**DYN.CON.**	Dynamic Range enhances a part of the grayscale to make it easier to display pathology.
10	**ENHANCE**	Due to this function a finer, sharper impression of the image is produced.
11	**REJECT**	It determines the amplitude-level below which echoes are suppressed (rejected).
12	Exit 	Press the **EXIT** key on the control panel to exit the M Sub menu.

For further details refer to the Voluson® 730Pro/ProV Basic User Manual, Chapter 6, M Mode.

4-4-2-1 MCFM Mode Check



By pressing the **M** control and the **C** control, the MCFM mode is switched on in the preparation mode. The M-cursor with M-Color window appears on the active 2D image.

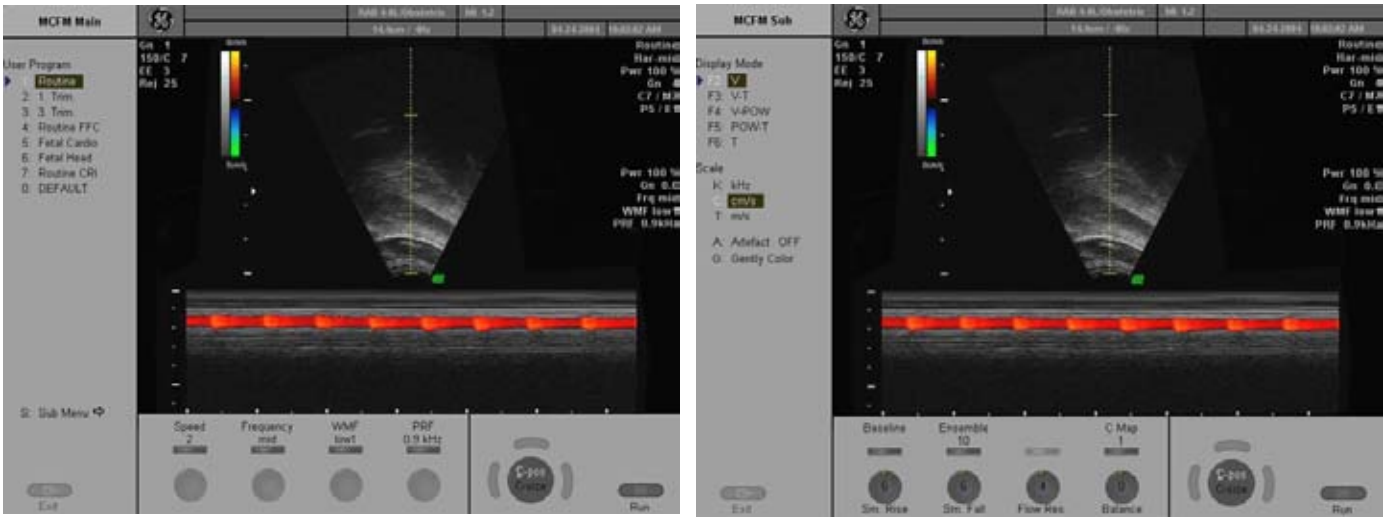


Figure 4-8 MCFM Main and MCFM Sub Menu

For further details refer to the Voluson® 730Pro/ProV Basic User Manual, Chapter 6.4.

4-4-2-2 MTD Mode Check

By pressing the **M** control and the **TD** control, the MTD mode is switched on in the preparation mode. The M-cursor with M-Color window appears on the active 2D image.

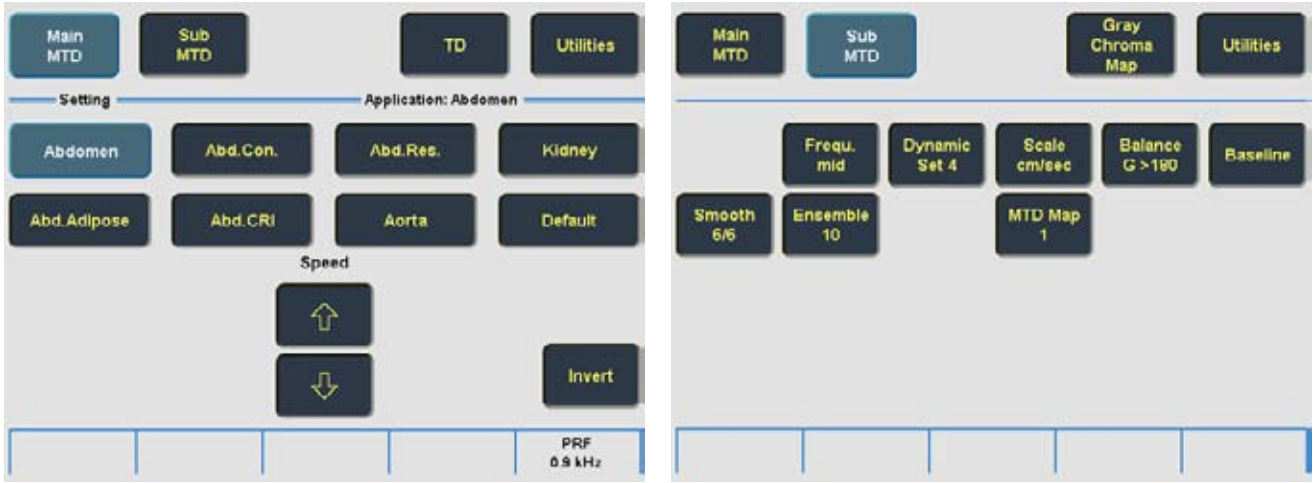


Figure 4-9 MTD Main and MTD Sub Menu

For further details refer to the Voluson® 730Pro/ProV Basic User Manual, Chapter 6.5.

4-4-3 Spectral Doppler Mode Checks

NOTE: Different menus are displayed depending on which Spectral Doppler Mode (PW or CW) is selected.

*NOTE: The Continuous Wave Doppler Mode is an Option. The **CW** key is only illuminated if the option is installed and the selected probe is capable for the Continuous Wave Doppler Mode.*

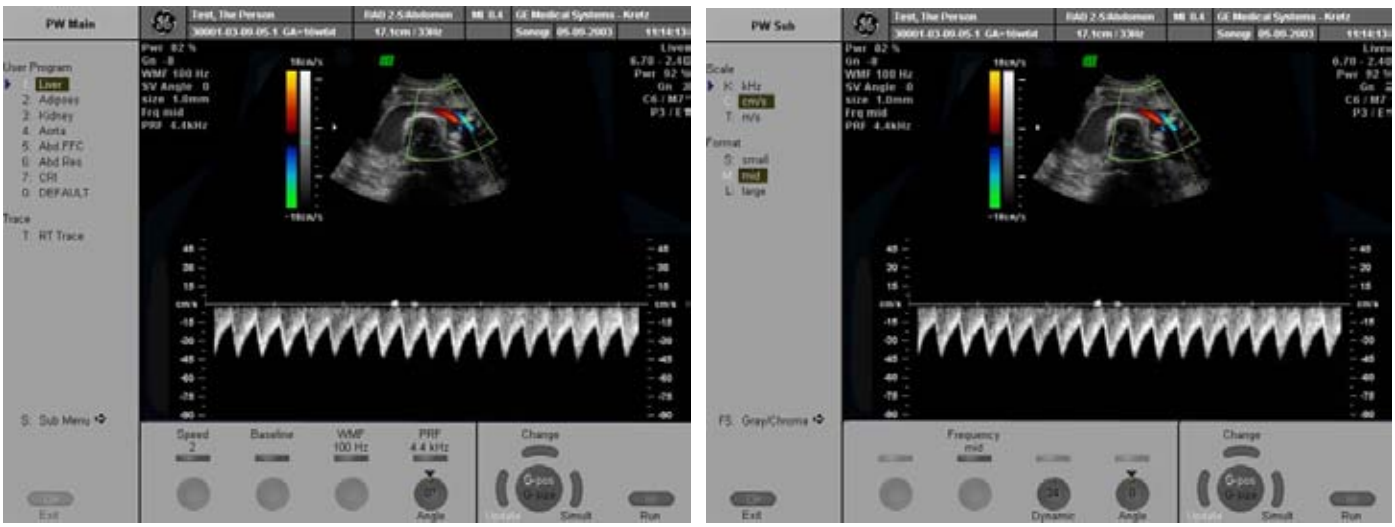


Figure 4-10 PW Main and PW Sub

Table 4-5 Spectral Doppler Mode (PW, CW) Functions

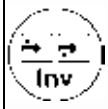
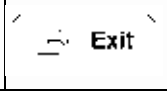
Step	Task	Expected Results
1	Gate Position and Gate Size	Adjust the Gate- position resp. size with the **TRACKBALL** in the 2D single image. The **upper trackball key** changes from Gate position to Gate size.
2	Activation of Doppler Mode	Press the **right trackball key** to activate the motion display. Press the **left trackball key** to activate both Modes (B/D).
3	Doppler Gain	Rotate the **PW MODE** key to adjust the amplification of the entire spectrum.
4	Steering	The steering function is only possible with linear probes.
5	RT TRACE (Real Time Auto-Trace)	The envelope curve of the Doppler spectrum (maximum velocities) and the corresponding evaluations are automatically displayed on the monitor.
6	Invert 	This function inverts the Doppler spectrum display in relation to the direction of the flow. (The Invert function is possible in read and write mode.)
7	**SPEED**	By touching up or down, four different sweep speeds can be selected.
8	**BASELINE**	Adjusting the baseline is possible in read- and write Mode (up/down in 8 steps).
9	**WMF** (Wall Motion Filter)	Used to eliminate Doppler “noise” that is caused by vessel wall motion.
10	**PRF**	The Velocity Range display is governed by the pulse repetition frequency (PRF) Exceeding the maximum PRF, the HPRF-Mode is automatically switched on.

Table 4-5 Spectral Doppler Mode (PW, CW) Functions

Step	Task	Expected Results
11	**ANGLE**	The angle cursor can be turned in both directions without stop. By pressing the angle knob repeatedly the angle correction switches from +60° to 0° and to -60°.
12	SCALE	To select the displayed measuring unit (in relation to the zero-line).
13	FORMAT	For selection of either one of three formats.
14	**FREQUENCY**	Serves for selection of the required transmit frequency for actual gate position.
15	**DYNAMIC**	Dynamic Range adjusts the display cutoff of the Doppler analysis waveform.
16	Exit 	Press the **EXIT** key on the control panel to exit the PW or CW Sub menu.

For further details see: Voluson® 730Pro/ProV Basic User Manual, Chapter 7, Spectral Doppler Mode.

4-4-4 Color Doppler Mode Checks

NOTE: Different menus are displayed depending on which Color Doppler Mode (CFM, PD or TD) is selected.

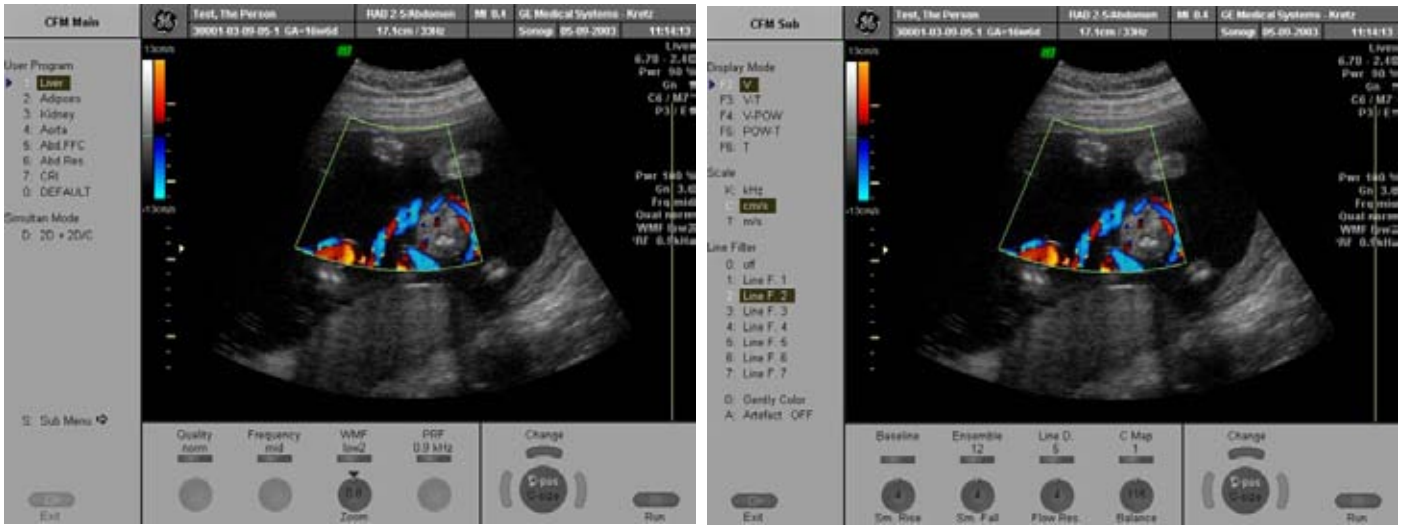


Figure 4-11 CFM Main and CFM Sub Menu

Table 4-6 Color Doppler Mode (CFM, PD, TD) Functions

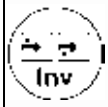
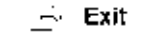
Step	Task	Expected Results
1	Color Box Position and Color Box Size	Adjust the Box- Position resp. Size with the **TRACKBALL** in the 2DSingle image. The **upper trackball key** changes from Box position to Box size.
2	CFM Gain PD Gain TD Gain	Rotate the **C MODE** key to ensure that continuous flow is displayed, where appropriate. Rotate the **PD MODE** key to adjust the Power Doppler Gain. Rotate the **C MODE** key to adjust the Tissue Doppler Gain.
3	2D+2D/C (PD or TD)	Changes the Single image display to two simultaneous half images. The left frame shows only the 2D Mode image. The right frame shows the 2D Mode image with color information.
4	Steering	Beam Steering is only possible with linear probes in CFM and PD Mode.
5	Invert 	The color of the color wedge inverts around the baseline. (impossible in PD Mode)
6	**QUALITY**	Improves the Color Resolution by reducing the image frame rate, respectively vice versa.
7	**FREQUENCY**	It serves for selection of the Transmit Frequency which also depends on the Color Box position.
8	**WMF** (Wall Motion Filter)	Used to eliminate Doppler “noise” that is caused by vessel wall or cardiac wall motion. (CFM,PD)
9	**PRF**	By touching toward up the PRF increases. By touching toward the PRF decreases.
10	**ZOOM**	Image magnification (PAN-Zoom) in read- and write mode.

Table 4-6 Color Doppler Mode (CFM, PD, TD) Functions

Step	Task	Expected Results
11	DISPLAY MODE	To select the CFM- Display Mode (V; V-T; V-Pow; Pow-T; or T).
12	SCALE (CFM, TD)	The maximum velocities are displayed above and under the color scale in kHz, cm/s or m/s.
13	LINE FILTER	With “Line Filter” the signals of the neighboring pulses are less weighted for the display of the actual pulse which considerably improves the detail lateral resolution and signal-to-noise ratio.
14	GENTLY COLOR	Gently means the transition between color and gray scale information. The embedding of the color into 2D Mode is performed smoothly with less colored splashes.
15	ARTEFACT (on/off)	Switch on/off the artifact suppression.
16	**BASELINE**	The baseline shift can be used to prevent aliasing in one flow direction similar to the Doppler baseline shift. There are 8 steps in each direction. (impossible in PD Mode)
17	**ENSEMBLE**	Controls the number of pulses to constitute one Color- or Power-Doppler line in the display.
18	**LINE D.**	Determines the line density within the Color-Box. The lower the line density, the larger the line distance and the size of the color pixels.
19	**C-MAP** (PD, TD)	Provides selectability of the color coding for an optimization of the display of blood flow (similar to the post-processing curves with grayscale 2D scans). After a selection has been made, the color bar displays the resultant map.
20	**SM. RAISE**	To select different filter periods for raising velocity. Filtering of the rise velocity leads to noise suppression.
21	**SM. FALL**	To select different filter periods for falling velocity. This filter leads for “prolongation” of the display flow.
22	**FLOW RES.**	The “Flow Resolution” function controls the axial resolution of color in the display. It adjusts the axial sample depth of color pixels.
23	**BALANCE**	The Balance controls the amount of Color display over bright echoes and helps to confine color within the vessels wall.
24	**THRESHOLD**	After **FREEZE** you can adjust the Color Threshold. It eliminates small color noise or motion artifact signals in the color image. (small number cuts off fewer signals than a higher setting)
25	Exit 	Press the **EXIT** key on the control panel to exit the CFM, PD or TD Sub menu.

For further details refer to the Voluson® 730Pro/ProV Basic User Manual:

- Chapter 8, CFM Mode (Color Flow Mode)
- Chapter 9, PD Mode (Power Doppler Mode)
- Chapter 10, TD Mode (Tissue Doppler Mode)

4-4-5 Volume Mode Checks

NOTICE Real Time 4D (freeware on Voluson® 730ProV), RT_4D_Biopsy*, VCI*, STIC*, TUI* and VOCAL II* are Options. If these options is not a part of the system configuration, the appendant checks can be omitted.

BT Version: "VCI" is optional at BT05 Voluson® 730Pro systems.
However, at Voluson® 730Pro systems with BT08 software (SW 5.4.x), this feature is standard.

NOTE: Different menus are displayed depending on which Menu and which Volume Mode is selected.

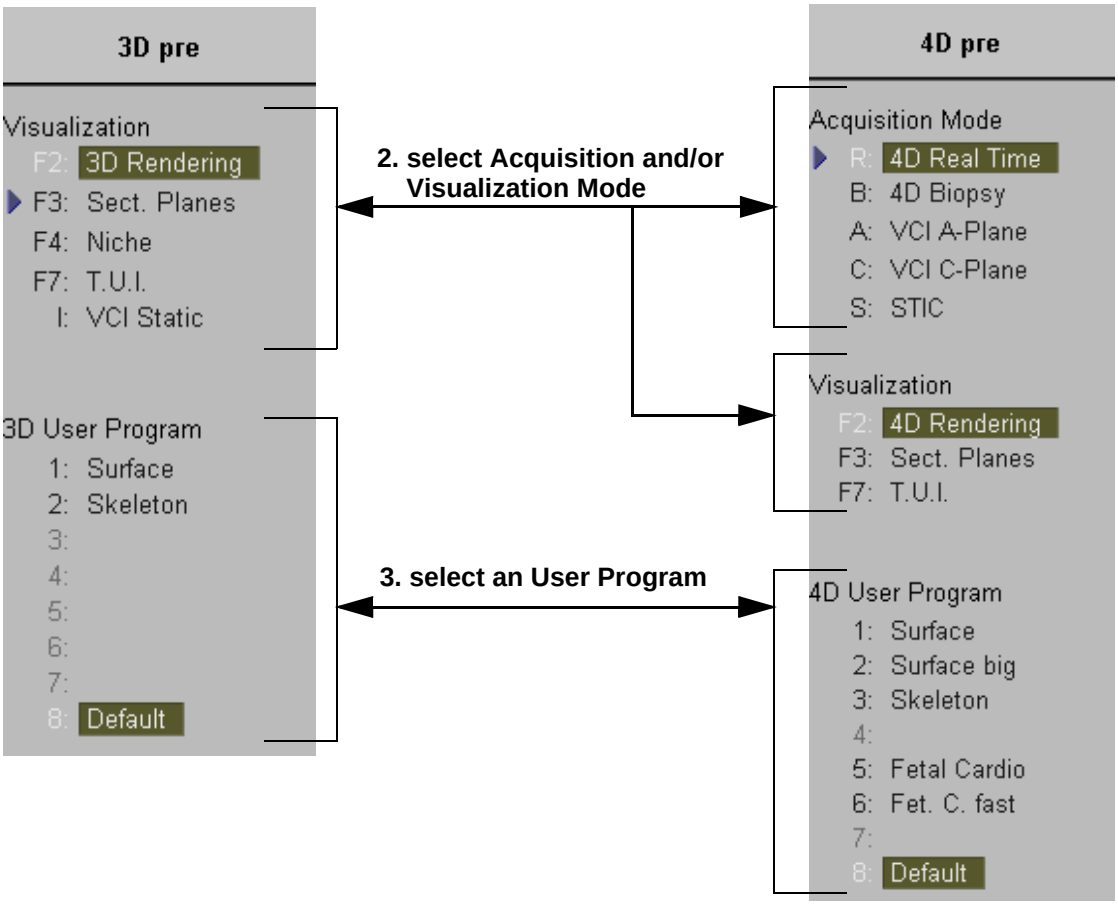
4-4-5-1 Pre-Volume Mode Functions

1. select the desired Volume Acquisition Mode:

3D **Volume Acquisition: Static 3D**

4D **Volume Acquisition: Real Time 4D**

The Volume Mode function is switched on, the "3D Pre" respectively "4D Pre" menu appears on the screen (write mode) and the volume box appears on the Image area.



4. Start the Volume Acquisition with the Freeze key resp. the right trackball key.

Figure 4-12 Pre-Volume Mode menus

Table 4-7 Pre-Volume Mode Functions

Step	Task	Expected Results
1	**AQUISITION:**	
	• 4D REAL TIME	Real Time 4D - continuous volume acquisition and parallel calculation of 3D rendered images
	• 4D BIOPSY *	Real Time 4D Biopsy - continuous volume acquisition and parallel calculation of 3D rendered image.
	• VCI A-PLANE *	Volume Contrast Imaging - improves the contrast resolution and the signal / noise ratio and therefore facilitates finding of diffuse lesions in organs
	• VCI C-PLANE *	Volume Contrast Imaging (coronal plane) - improves the contrast resolution and the signal / noise ratio and therefore facilitates finding of diffuse lesions in organs
	• STIC *	With this acquisition method the fetal heart or an artery can be visualized in 4D. (also in combination with PD or CFM Mode)
2	**VISUALIZATION:**	
	• 3D RENDERING	3D Static volume acquisition + rendered 3D image (also in combination with PD or CFM Mode) After the 3D acquisition the system switches automatically to the read menu. The selected format will be present on the monitor (e.g., A, B, C + rendered 3D image).
	• 4D RENDERING	Continuous volume acquisition + calculation of rendered 3D image in real time
	• SECT. PLANES	3D Static volume acquisition resp. 4D volume acquisition without rendered 3D image (also in combination with PD or CFM)
	• NICHE	Parts of orthogonal sections A, B and C are compiled to a 3D-section aspect. The name “Niche” has been chosen because the aspect shows a quasi spatial cut into the reference image.
	• T.U.I. *	This method of visualization is consistent with the way other medical systems such as CT or MRI, present the data to the user (slices through the data set, which are parallel to each other).
	• VCI STATIC *	The data set is represented such as in Static 3D - Sectional Planes. However, the three planes are VCI renderings (tissue information of a thick slice), computed from the 3D dataset.
3		- Quarter size display of Sectional Planes without 3D image **or** - Quarter size display of Sectional Planes + rendered 3D image (Note: The display depends on selected Acquisition- and Visualization Mode!)
4		Dual size display of Sectional Planes + rendered 3D image. (Note: The display depends on selected Acquisition- and Visualization Mode! This format is not possible for Static 3D Acquisition)
5		- Full size display of a the reference image **or** - Full size display of the rendered 3D image. (Note: The display depends on selected Acquisition- and Visualization Mode!)
6	Volume Box Position and Volume Box Size	Adjust the Volume Box (ROI) Position resp. Size with the **TRACKBALL** in the 2D Single image. The **upper trackball key** to change the Trackball function from Box Position to Box Size.
7	**QUALITY**	Changes the line density against the acquisition speed (low, mid1, mid2, high1, high2).
8	**VOL. ANGLE**	To select the Volume Sweep Angle.
9	Start Acquisition	Press the **FREEZE** key resp. the **right trackball key** to start the Volume acquisition.

4-4-5-2 Functions after the 3D Acquisition

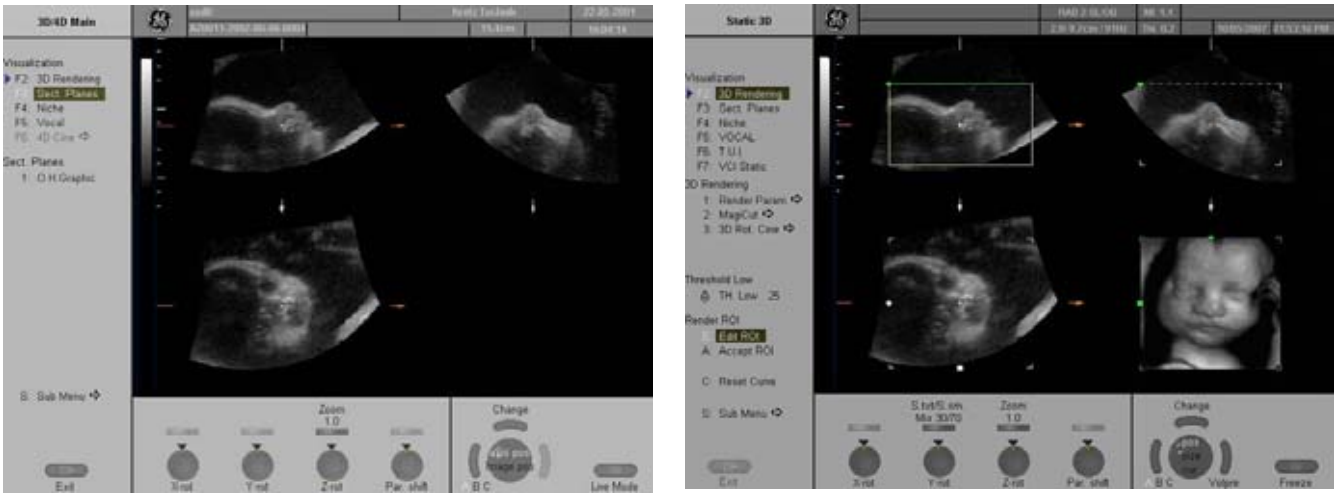


Figure 4-13 3D/4D Main - Sectional Planes and Image Rendering

Table 4-8 Functions after the 3D Acquisition

Step	Task	Expected Results
1		**X-ROT**: Rotation about X-axis of the reference image. **Y-ROT**: Rotation about the Y-axis of the reference image. **Z-ROT**:Rotation about the Z-axis of the reference image.
2		**PAR. SHIFT**: Movement along Z-axis of the reference image. **TRACKBALL**: Movement along X- and Y-axis of the reference image.
3	NICHE	Parts of the orthogonal sections A, B and C are complied to a 3D section aspect. The aspect shows quasi a spatial cut into the reference image.
4	VOCAL *	The basic idea behind VOCAL II is the combination of 3D ultrasound tissue (presented as voxels) and the geometric information of surfaces in a 3D dataset. After definition of contour in 3D space (semi-automatically, manually or spherical) a wide range of functionality is given.
5	O.H. GRAPHIC	Display of orientation help image figure.
6	Choosing a reference image	Press the **left trackball key** repeatedly to choose the Reference image among A, B or C. Choosing a reference image automatically determines the control functions of the rotary controls and the trackball for the liberal adjustment of a sectional plane.
7	Initial Condition	Resets the rotations and translations of a volume section to the initial (start) position.

Table 4-8 Functions after the 3D Acquisition

Step	Task	Expected Results
8	3D Image Orientation	To change the image orientation of the rendered 3D image.
9	**ZOOM**	The 3D image as well as the sectional planes can be varied by their aspect ratio.
10	**S.TXT/S.SM. MIX**	To adjust the mix ratio between two calculated modes.
11	TH. LOW respectively PD LOW in case of 3D+PD	All echoes below the level will be disregarded for calculation of the surface. All color values below the level will be disregarded for calculation of the surface.
12	MAGI CUT	Ability to electronically manipulate the images and cut way “3D artifacts”.
13	RENDER PARAM.	To select the Render Mode (Basic Mode and Render Algorithm)
14	RESET CURVE	Reset the curvature of render start to default position

4-4-5-3 Sub Menu

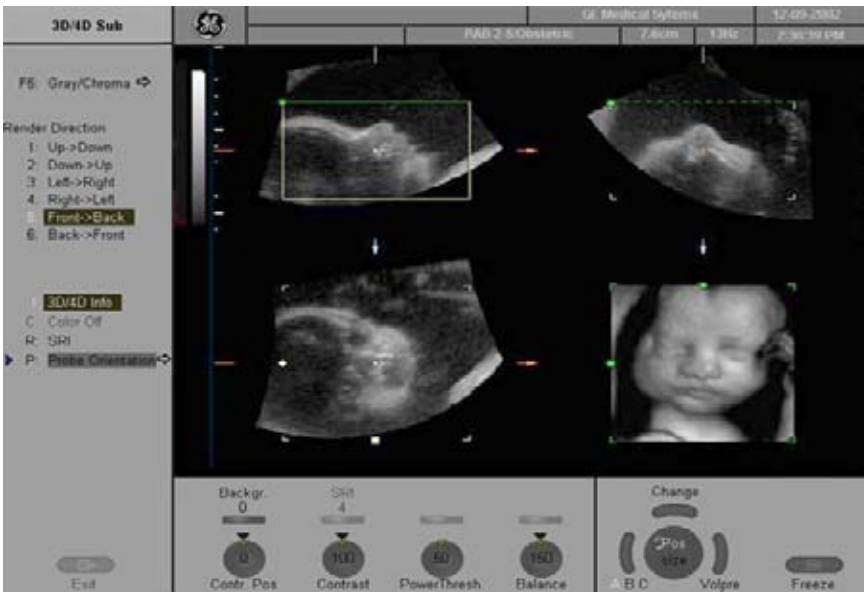


Figure 4-14 3D/4D Sub Menu

Table 4-9 Sub Menus

Step	Task	Expected Results
1	RENDER VIEW DIRECTION	To select the desired Render View Direction (green line symbolizes direction of the view). Note: The Render View Direction keys are not available in Static 3D Sectional Planes.
2	GRAY/CHROMA	Depending on individual requirements a “harder” or “softer” image can be obtained.
3	3D/4D INFO	On/Off switch to show full or reduced Image Info parameter on screen.
4	COLOR OFF	On/Off switch to show an acquired 3D+CFM or 3D+PD image with or without the color information.
5	SRI *	Speckle Reduction Imaging (SRI) can be activated in all 3D/4D modes (except Full size display) to reduce speckle which interferes with the sectional planes (A, B and C). **Note:** The rendered 3D image is not affect.
6	**BACKGR.**	Adjusts the contrast of the screen background from dark to bright. Note: This key is not available in Static 3D Sectional Planes mode.
7	**CONTR. POS**	To set the start point of the gamma curve bending. (Graphic display on screen) Note: This key is not available in Static 3D Sectional Planes mode.
8	**CONTRAST**	To set the contrast of the bending. (Graphic display on screen) Note: This key is not available in Static 3D Sectional Planes mode.
9	**POWER THRESH.**	Only available if a 3D+CFM or a 3D+PD image is acquired. Note: This key is only available if a 3D+CFM or a 3D+PD image is acquired.
10	**BALANCE**	Only available if a 3D+CFM or a 3D+PD image is acquired. Note: This key is only available if a 3D+CFM or a 3D+PD image is acquired.
11	**PROBE ORIENTATION**	Adjust and activate the display of direction markers at border of the image.

For further details refer to the Voluson® 730Pro/ProV Basic User Manual, Chapter 11.

4-4-6 Using Cine

4-4-6-1 Activating Cine

Press **FREEZE**, then roll the **TRACKBALL** to display the images of the stored sequence one by one.

4-4-6-2 Cine-Split Function (Multiple Format)

After **FREEZE** of a sequence in 2D Mode two or four different images of the sequence can be displayed simultaneously in Dual respectively Quad Display Mode.

Move the **TRACKBALL** to display the images of the stored sequence. Use the **FORMAT** keys to change to the next (part of) frozen 2D image sequence to play back the cine memory.

NOTE: The Cine-Split function (multiple format) is also possible in 2D Auto Cine mode.

4-4-6-3 Activating 2D Auto Cine

1.) After Freeze press the **LEFT TRACKBALL KEY**.
2.) Select the start image of the sequence by rotating the **START** digipot. The selected image is simultaneously displayed.
3.) Turn the **END** digipot to the end image of the sequence. The selected image is displayed.
4.) Select the review **SPEED** and the read **ZOOM** factor.
5.) Select the Cine Mode review direction.
6.) To start/stop the Cine Loop playback press the **RIGHT OR LEFT TRACKBALL KEY**.

After stopping the sequence, move the **TRACKBALL** to display the images one by one.

4-4-6-4 Spectral Doppler- or M Cine Loop

Press **FREEZE**, then roll the **TRACKBALL** to display the Cine / Loop one by one.

The **UPPER TRACKBALL KEY** changes from the 2D Cine to the D Loop (respectively M Loop).

*NOTE: The active Cine is displayed on the screen: **Cine xxx**/Loop or Cine/**Loop xxx**.*

4-4-6-5 Activating 3D Rotation Cine

1.) After 3D Volume acquisition select the 3D ROT. CINE item from the menu area.
2.) Select the ROTATION ANGLE from the menu area or manually with **START** / **END** rotary controls.
3.) Select the STEP ANGLE and the ROTATION AXIS.
4.) Select CALCULATE or press the **RIGHT OR LEFT TRACKBALL KEY** to start the calculation.
5.) To start/stop the 3D Rotation Cine sequence press the **RIGHT OR LEFT TRACKBALL KEY**.

4-4-6-6 Activating Volume Cine

1.) After Real Time 4D acquisition move the **TRACKBALL** horizontally to display the Volumes of the stored sequence one by one. (Alternative use the **VOL CINE #** control to select the desired volume.) For further details refer to the Voluson® 730Pro/ProV Basic User Manual, Chapter 11.

4-4-6-7 Activating 4D Cine

1.) After Real Time 4D acquisition press **UPPER TRACKBALL KEY** to display the “4D Cine” menu.
2.) Press the **LEFT TRACKBALL KEY** (Toggle function: Start/Stop).
3.) Select the Cine Mode direction and the review **SPEED**.
4.) To start/stop the Real Time 4D Cine sequence press the **LEFT TRACKBALL KEY**.

*NOTE: After stopping a sequence, move the **TRACKBALL** to display the images / volumes one by one.*

4-4-7 Generic Measurements

NOTE: Different menus are displayed depending on:
• the currently selected Application and Display Mode,
• the selected "Study",
*• and the settings in the Measure Setup - **MEASURE & CALC** page.*

For further details refer to the Voluson® 730Pro/ProV Basic User Manual, Chapter 13.

General remarks to perform Generic Measurements:

- By pressing the **CALIPER** key on the control panel the Generic Measurement function is switched on.
- Selection of the desired measurement marks is done with the **NAVIGATION WHEEL** or by pressing the corresponding keyboard shortcuts.
- If the **TRACKBALL MENU NAVIGATION** key is illuminated, the trackball is consequently assigned to select the menu items in the menu area on the left side of the screen.
- Positioning of measurement marks is done with the **TRACKBALL**.
- Entering and storage of measuring marks is done with **SET** (right or left trackball key).
- To change measuring marks before completion press **CHANGE** (upper trackball key).
- Depending on the setting in the Measure Setup, also the **FREEZE** key can be used for confirming the last measuring mark of the currently performed measurement.
- To cancel the measurement of the currently selected item, select CANCEL or press **BACKSPACE**.
- To delete the results of the last measured item, select DELETE or press **BACKSPACE**.
- To delete all measurement results of the selected "Study" from the monitor as well as from the corresponding Worksheet, select the CLEAR GROUP or press the **DELETE** key.
- All measurement results will be automatically included in the "Generic" patient worksheet.
- To erase measurement results, press the **CLEAR ALL** key on the control panel or the **DELETE MEAS.** key on the keyboard.
- To exit from Generic measurements, press the **CALIPER** key or the **EXIT** key on the control panel.

*NOTE: The following instructions assume that you first scan the patient and then press **FREEZE**.*

4-4-7-1 Distance and Tissue Depth Measurements (2D and M Mode)

1.) Press the **CALIPER** key and then select the GENERIC DIST. in the menu area.
2.) Select the appropriate item from the menu area. An active cursor appears.
3.) To position the active cursor at the start point (distance) or the most anterior point (tissue depth), move the **TRACKBALL**.
4.) To fix the start point, press **SET** (the right or left trackball key).
The system fixes the first cursor and displays a second active caliper.
5.) To position the second active caliper at the end point (distance) or the most posterior point (tissue depth), move the **TRACKBALL**.
6.) To complete the measurement, press **SET**.
The system displays the distance or tissue depth value in the measurement results window.

Before you complete a measurement:

To toggle between active calipers, or to re-adjust the traced line, press the upper trackball key.

To erase results, press the **CLEAR ALL** key on the control panel or the **DELETE MEAS.** key on the keyboard.

*NOTE: To alternate the control from one cursor to the other, press **CHANGE** (the upper trackball key).*
*To re-adjust a traced line, press **UNDO** (the upper trackball key) repeatedly.*

4-4-7 Generic Measurements (cont'd)

4-4-7-2 Circumference/Area Measurements

1.) Press the **CALIPER** key and then select the GENERIC AREA in the menu area.
2.) Select the corresponding item from the menu area. An active cursor displays.
3.) To position the active cursor, move the **TRACKBALL**.
4.) To fix the start point, press **SET** (the right or left trackball key). The system fixes the first cursor and displays a second active caliper.
5.) To position the second caliper, move the **TRACKBALL** and press **SET** (Rt. / Lt. trackball key).

NOTE: If you have selected a "trace" item, the measurement is finished and the area and circumference results appear on the screen.

6.) An ellipse appears the axis of which is defined by these two points.
To adjust the width of the ellipse, move the **TRACKBALL**.
7.) To toggle between calipers, or to readjust a traced line, press the upper trackball key.
8.) To complete the measurement, press **SET** (right or left trackball key). The system displays the circumference and area in the measurement results area.

Before you complete a measurement:

- To erase the ellipse resp. trace and the current data measured, select DELETE or press the **BACKSPACE** key on the keyboard.
  The original caliper is displayed to restart the measurement.
- To exit the measurement function, press the **CALIPER** key or **EXIT** key on the control panel.

4-4-7-3 Volume Measurements

1.) Press the **CALIPER** key and then select the GENERIC VOLUME in the menu area.
2.) Select the appropriate item.
3.) Perform the measurement(s) using the **TRACKBALL** and **SET** (right or left trackball key).
For further details: see 4-4-7-1 and 4-4-7-2.

4-4-7-3-1 Multiplane Measurements

NOTE: This volume measurement is only possible in 3D Mode.

1.) Select the reference image in which the measurement is to be performed (A, B or C).
2.) Press the **CALIPER** key once and then select the MULTIPLANE item in the menu area.
3.) Select the first section through the body by rotating the **REF.SLICE** digipot (first section should be set at the edge of the object).
4.) Position the start dot of the area which should be surrounded and store it with **SET**.
5.) Surround the area with the trackball, then press **SET** (right or left trackball key). The area is calculated and displayed. It may even be "zero". Press the **SET** key twice.
6.) Select the next parallel section with the **REF. SLICE** digipot and measure the area.
7.) Repeat 5. and 6. until the edge of the measured object is reached.

NOTE: The contour of the measured area is not erased if a new section is adjusted.
To call back the measured areas touch the PREV / NEXT flip switch control.

NOTE: To erase the results, select the INIT item at the menu area.

4-4-7 Generic Measurements (cont'd)

4-4-7-4 Measurements in Spectral Doppler Mode

NOTE: The Spectral Doppler image is displayed based on time (X-axis) and velocity (Y-axis).

4-4-7-4-1 Auto Trace

1.) Press the **CALIPER** key.
2.) Select AUTO TRACE item from the menu area on the left side of the screen. It traces the Spectral Doppler image automatically and displays the results.
3.) Select the **SENSITIVITY** of the envelope curve (to eliminate artifacts).
4.) Select the **TRACE MODE** channel of the envelope curve (upper, both, lower).
5.) If necessary, select the Angle and the Baseline.
6.) Press the right or left trackball key **SET** to finish the measurement.

Before you complete the measurement:

- To readjust the start cycle (vertical yellow line), press **CHANGE** (upper trackball key). Press **SET** (right or left trackball key) to fix the line.
- Press the **CHANGE** key again to readjust the end cycle (vertical green line). Press **SET** to fix the line.

NOTE: The determination of the envelope curve requires a clear and low-noise record of the Doppler spectrum. Otherwise the reliability of the displayed measurement results may not be ensured!

4-4-7-4-2 Manual Trace

1.) Press the **CALIPER** key.
2.) Select the MANUAL TRACE item from the menu area. A cursor appears on the screen.
3.) Move the cursor with the **TRACKBALL** to the start point of the measurement and press **SET** (right or left trackball key) to fix the marker.
4.) Trace to the end of the period and press the **SET** key again to fix the mark. The measurement results appear on the screen.

Before you complete the measurement:

To readjust the traced line, press **UNDO** (upper trackball key) repeatedly.

4-4-7-4-3 Heart Rate

1.) Press the **CALIPER** key.
2.) Select the HR item from the menu area. A line appears on the screen.
3.) Move the line with the **TRACKBALL** to the start point of the period and press **SET** (right or left trackball key). A second line appears.
4.) Move the second line to the end point of the period.
5.) Select the number of "HR cycles" for the measurement with the digipot.
6.) Press the **SET** (right or left trackball key) again to fix the line. The Heart Rate is displayed.

NOTE: For further Doppler Measuements and other details refer to the Voluson® 730Pro/ProV Basic User Manual, Chapter 13

4-4-8 Calculations

The Voluson® 730Pro/ProV system supports calculation packages and application-oriented patient Worksheets (Reports) for following applications:

- Abdomen Calculations
- Small Parts Calculations
- Obstetric Calculations
- Cardiology Calculations
- Urology Calculations
- Vascular Calculations
- Gynecology Calculations
- Pediatric Calculations
- Neurology Calculations
- Orthopedics Calculations

NOTE: Confirm that the patient information is correct and the probe and application are selected properly.

NOTE: Different menus are displayed depending on:
• the currently choosen Application
• the selected Display Mode,
• the selected "Study",
• and the settings in the Measure Setup - **MEASURE & CALC** *page.*

For further details refer to the Voluson® 730Pro/ProV Basic User Manual, Chapter 14

General remarks to perform Calculations:

- By pressing the **CALC** key on the control panel the Calculation function is switched on.
- Selection of the desired measurement marks is done with the **NAVIGATION WHEEL** or by pressing the corresponding keyboard shortcuts.
- If the **TRACKBALL MENU NAVIGATION** key is illuminated, the trackball is consequently assigned to select the menu items in the menu area on the left side of the screen.
- Positioning of measurement marks is done with the **TRACKBALL**.
- Entering and storage of measuring marks is done with **SET** (right or left trackball key).
- To change measuring marks before completion press **CHANGE** (upper trackball key).
- Depending on the setting in the Measure Setup, also the **FREEZE** key can be used for confirming the last measuring mark of the currently performed measurement.
- To cancel the measurement of the currently selected item, select CANCEL or press **BACKSPACE**.
- To delete the results of the last measured item, select DELETE or press **BACKSPACE**.
- To delete all measurement results of the selected "Study" from the monitor as well as from the corresponding Worksheet, select the CLEAR GROUP or press the **DELETE** key.
- All measurement results will be automatically included in the "Generic" patient worksheet.
- To erase measurement results, press the **CLEAR ALL** key on the control panel or the **DELETE MEAS.** key on the keyboard.
- To exit from Generic measurements, press the **CALIPER** key or the **EXIT** key on the control panel.

4-4-8-1 Worksheet (Report) Pages

Press the **WORKSHEET** key on the control panel to view the "application dependent" patient worksheet pages that contain the results of calculations and measurements. Any stored patient worksheet can be edited, printed, transferred, saved to Sonoview or sent to DICOM server.

4-4-9 Probe/Connectors Usage

4-4-9-1 Connecting a probe

1.) Place the probe's carrying case on a stable surface and open the case.
2.) Carefully remove the probe and unwrap the probe cable.
3.) DO NOT allow the probe head to hang free. Impact to the probe head could result in irreparable damage.
4.) Turn the connector locking handle counterclockwise.
5.) Align the connector with the probe port and carefully push into place.
6.) Turn the connector locking handle clockwise to secure the probe connector.
7.) Open the right-hand side door, lay the cable into the intended cable holders and close the door. So it is free to move, but not resting on the floor.

4-4-9-2 Activating the probe

1.) Press the **PROBE** key to activate the “Probe Select” menu.
2.) Select the appropriate probe using the **TRACKBALL** and the **TRACKBALL KEYS**.
3.) Upon selection of an “Application”, the programmed user presets appear.
4.) Clicking a “Setting” field causes loading of the preset.

The probe is initialized, the main menu (2D mode) and the ultrasound image appears on the monitor in write mode (real time display).

4-4-9-3 Deactivating the probe

When deactivating the probe, the probe is automatically placed in standby mode (read mode).

1.) Press the **FREEZE** key.
2.) Gently wipe the excess gel from the face of the probe. (Refer to the Basic User Manual of Voluson® 730Pro/ProV for complete cleaning instructions.)
3.) Carefully slide the probe around the right side of the keyboard, toward the probe holder. Ensure that the probe is placed gently in the probe holder.

4-4-9-4 Disconnecting the probe

Prior to disconnect a probe freeze the image. It is unnecessary to switch the unit off.

CAUTION **If a probe is disconnected while running (write mode) a software error may occur. In this case switch the unit OFF (perform a reset).**

1.) Open the right-hand side door, remove the cable from the cable holder and close the door.
2.) Turn the probe locking handle counterclockwise. Pull the probe and connector straight out of the probe port.
3.) Carefully slide the probe and connector away from the probe port and around the right side of the keyboard. Ensure the cable is free.

4-4-10 Image Management (Sonoview)

For Sonoview - Image Management functionality refer to Chapter 15 in the Basic User Manual of Voluson® 730Pro/ProV. It talks about several topics:

- Clipboard
- Sending Exams
- Printing Exams / Images
- Export Exams / Images
- Backup Exams
- Restore the Backup Exams
- DICOM Print / Send
- Verifying and Pinging a Device
- Sending Images via e-mail
- Browsing and Managing an Exam's stored Image
- Connectivity, and Dataflow Concept and Creation
- Configuring Connectivity
- Services (Destinations)
- Input of comments and voice annotations
- Measure Distance and Ellipse
- Buttons
- Views
- DVD/CD+(R)W and MO Erasing/Formatting
- Changing Backup Folder on mapped Network Drive
- etc.

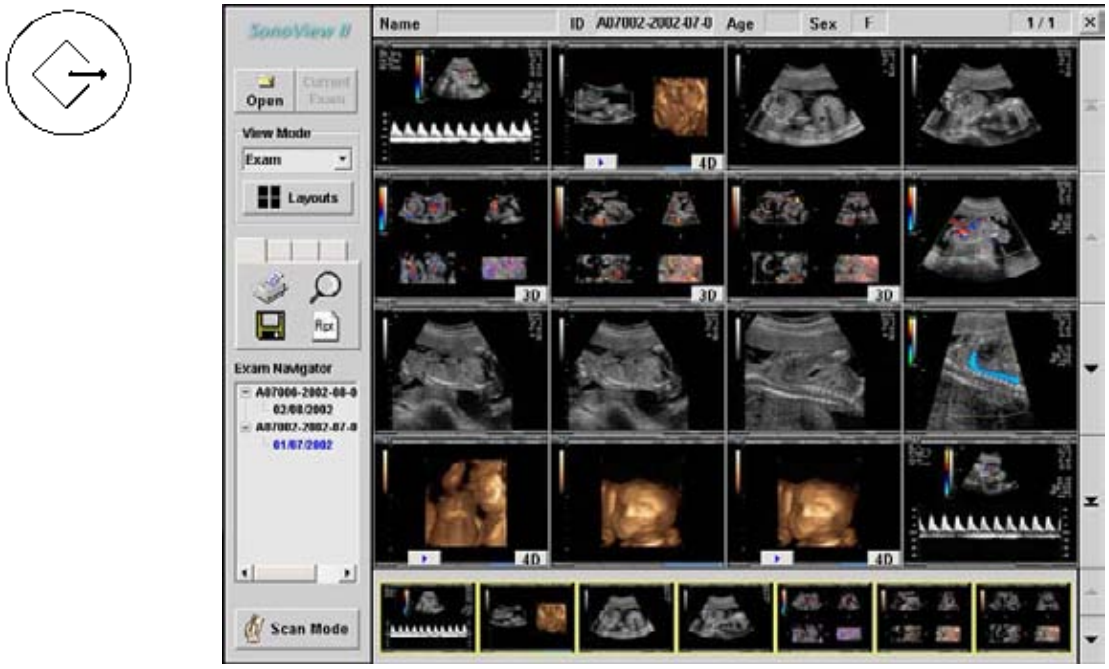


Figure 4-15 Sonoview

4-4-11 Using the MOD (Magneto-Optical Drive)

NOTICE The MOD (Magneto-Optical Drive) is an Option.

The optional 3.5 inch Magneto-Optical disk drive supports the following medias:

1.3GB; 640MB; 540MB; 230MB and 128MB

Figure 4-16 Magneto-Optical Drive

1.) Before installing an MO disk in the MOD, check the MO disk for loose hardware or damaged labels which could jam inside the MOD. Also, ensure that the slide switch in one corner of the disk is set so that the disk is write enabled (disk hole closed).

2.) Insert the disk into the MOD with the label facing up.

NOTICE **Never move the unit with a disk in the MOD because the drive actuator will not be locked and the MOD could break.**

3.) There are different methods to eject a disk from the MOD. Manual ejection methods are listed below in preferred order from best (1) to worst (3).

a.) Press the **EJECT** switch on the MOD while system is ON.

b.) Press and hold the **EJECT** switch while the system is booting.

c.) Mechanical ejection. Insert the end of a paper clip into the hole next to the **EJECT** switch while system power is OFF.

NOTICE **Avoid mechanical ejection whenever possible. Mechanical ejection leaves the actuator unlocked and the MOD susceptible to damage if moved. If forced to use this method, reboot the system, then insert and eject a known good disk using one of the other manual ejection methods.**

4-4-11-1 Formatting Media

To erase/format the backup media, DVD/CD+(R)W or MOD, press the **SONOVIEW** key on the Control panel.

The Sonoview screen appears on the monitor; see: Figure 4-15 on page 4-28.

a.) Select the “DVD/CD+(R)W and MO Formatting” tool on the left side of the Sonoview screen.
b.) Insert the medium and select the DVD/CD+(R)W or the MO icon.

By selecting MO cartridge the unit displays the “MO Disk Formatter” window as shown in Figure 4-17.

1.) Select a Format Type from the drop down menu. If desired, mark the Low Level Format icon.
2.) Click the START button to start the formatting process.

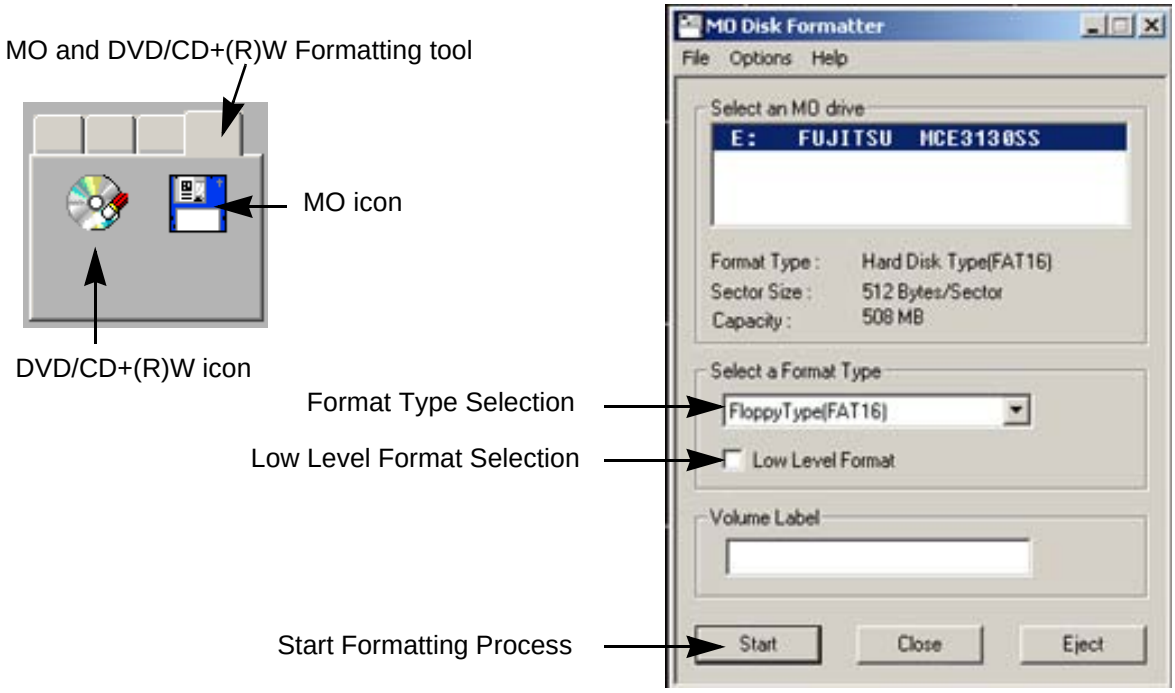


Figure 4-17 MO Disk Formatter Window

3.) A message box appears on the screen. Confirm with OK.
4.) When the formatting has been completed, click OK to continue.

Figure 4-18 MO Disk Formatter messages

5.) Select the CLOSE button and press the **EXIT** key on the control panel to return to the Scan Mode.

4-4-11-1 Formatting Media (cont'd)

By selecting DVD/CD the unit displays the "Erase DVD/CD" window as shown in Figure 4-19.

1.) Select the "Erase Mode" and click the [OK] button to start the process.

NOTICE It is highly recommended to use the complete erase mode, to avoid problems with the CD-(R)W or DVD-(R)W! When using a DVD-(R)W, the complete erase mode is not possible.

Figure 4-19 Erase DVD/CD Window

2.) During erasing the Ultrasound system displays following message.

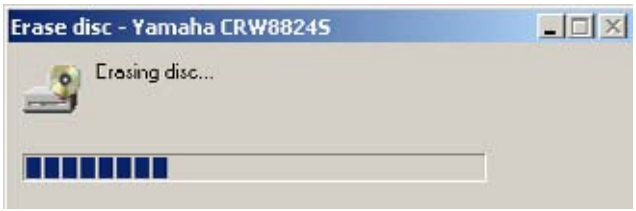


Figure 4-20 Erasing disk

3.) Press the **EXIT** key on the control panel to return to the Scan Mode.

4-4-11-1-1 Adjusting the Write Speed of the DVD/CD Recorder

1.) Click the SETTINGS icon on the left side of the Sonoview screen.

2.) Select DVD/CD RECORDER from the tool bar.

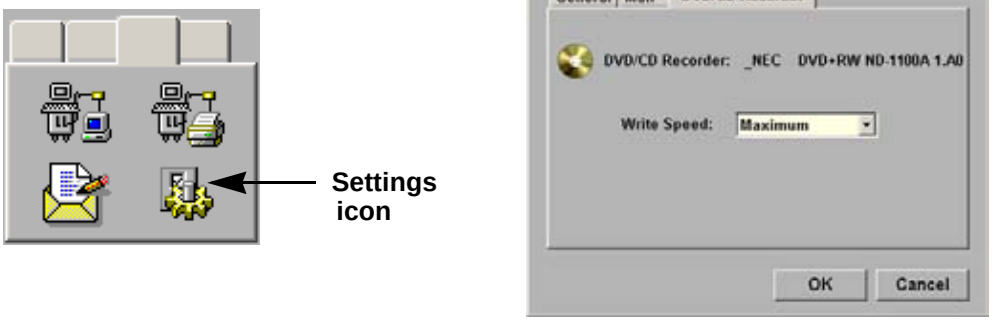


Figure 4-21 Settings of the DVD/CD Recorder

3.) Choose the "Write Speed" from the corresponding pop-up menu.

Section 4-5
Backup and Restore Database, Preset Configurations and Images

1.) Press the **UTILITIES** key on the control panel. The menu area changes to the Utilities menu.
2.) Select the SYSTEM item from the menu area to activate the setup desktop screen.
3.) Select the BACKUP page.

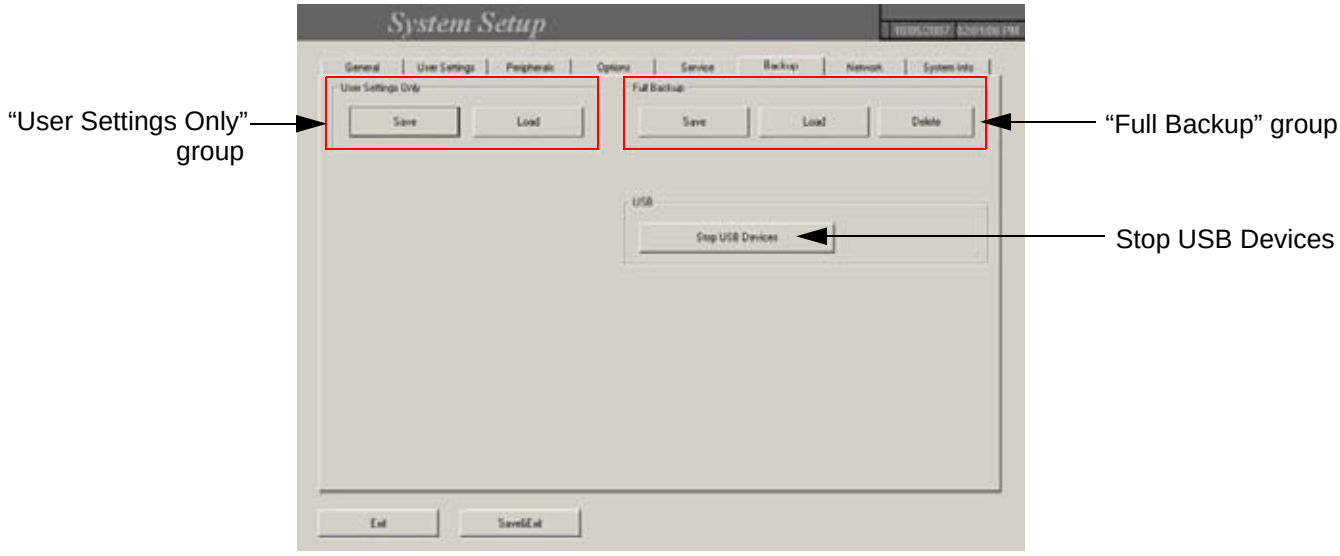


Figure 4-22 System Setup - Backup page

The "Backup" page is subdivided in two main groups:

A.) User Settings Only

- Section 4-5-1 "Save User Settings Only (Application Settings)" on page 4-33
- Section 4-5-2 "Load User Settings Only (Application Settings)" on page 4-34

B.) Full Backup

- Section 4-5-3 "Save Full Backup (Presets, Configurations & Application Settings)" on page 4-36
- Section 4-5-4 "Load Full Backup (Presets, Configurations & Application Settings)" on page 4-38
- Section 4-5-5 "Delete Full Backup (Presets, Configurations & Application Settings)" on page 4-40

The User Settings and/or Full Backup can be saved to the following destinations:

- D: partition of internal hard disk
- DVD/CD+(R)W
- MOD (if present)
- Mapped Network Drive **Z:**
  see: Section 3-11-1 "Map Network Drive" on page 3-70
- USB-Stick
- Any other drive connected to the system (e.g.; an external USB-hard disk)
  Note: This function is only available in the Full Backup utility.
  For further details review: Section 3-5-13 "External USB-Devices" on page 3-32.

NOTICE When connecting external USB devices, be sure to execute Safety Directions found in Chapter 2 of the Voluson® 730Pro/ProV (BT05, BT08) Basic User Manual.

4-5-1 Save User Settings Only (Application Settings)

The User Settings contains:

- Application Settings
- User Programs
- Auto Text
- 3D/4D Programs

1.) Insert a DVD/CD+(R)W or MO (Magneto-Optical Disk) into the drive.
2.) Press the **UTILITIES** key on the control panel. The menu area changes to the Utilities menu.
3.) Select the SYSTEM item from the menu area to activate the setup desktop screen.
4.) Select the BACKUP page.
5.) Click the SAVE button of the “User Settings Only” group.

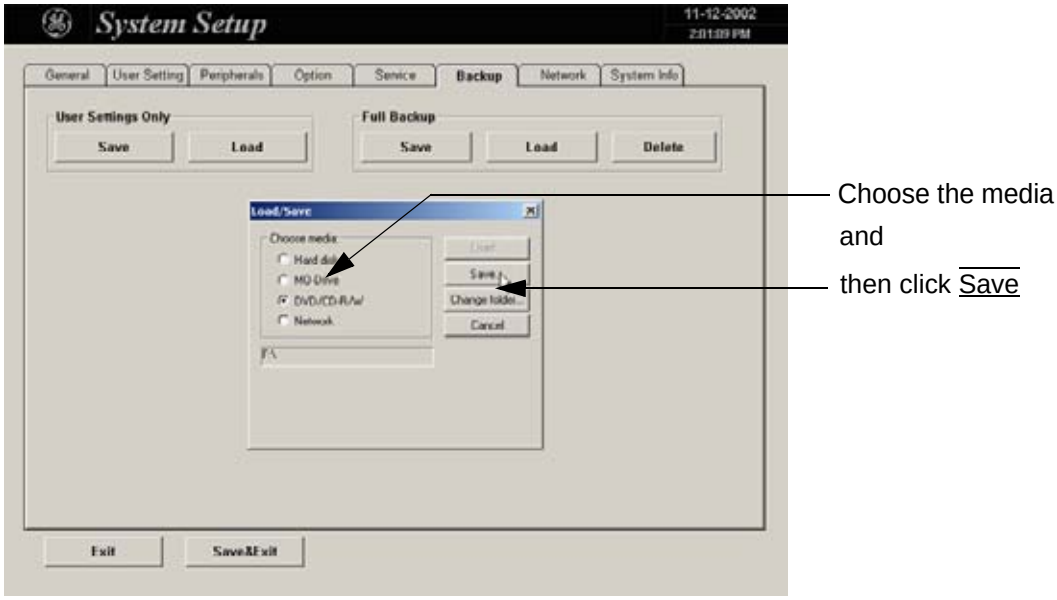


Figure 4-23 User Settings Only - Save window

6.) Choose the media (e.g., DVD/CD+RW) and click the SAVE button.
7.) Select the NEW FILE... key and enter a file name (without extension).
8.) Click the OK key to start the process. When the saving has been completed, click OK.

4-5-2 Load User Settings Only (Application Settings)

CAUTION The loading procedure overwrites the existing application settings on the local hard drive. Make sure to insert the correct DVD/CD or MO. Additionally you can load the backup from D:\User Settings.

1.) Insert the DVD/CD+(R)W or MO (Magneto-Optical Disk) into the drive.
2.) Press the **UTILITIES** key on the control panel. The menu area changes to the Utilities menu.
3.) Select the SYSTEM item from the menu area to activate the setup desktop screen.
4.) Select the BACKUP page and click the LOAD button of the “User Settings Only” group.

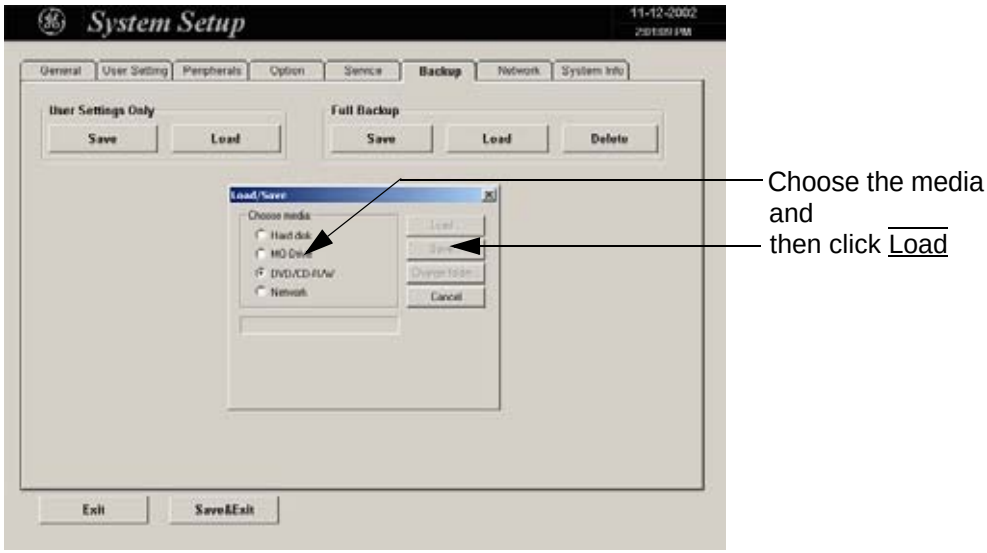


Figure 4-24 User Settings Only - Load window

5.) Choose the media (e.g., DVD/CD+RW) and click the LOAD key.
6.) Select the appropriate file and click OK. The “Load Backup Data” window appears.

NOTICE It is highly recommend to use Application settings which are adapted for the systems software version!

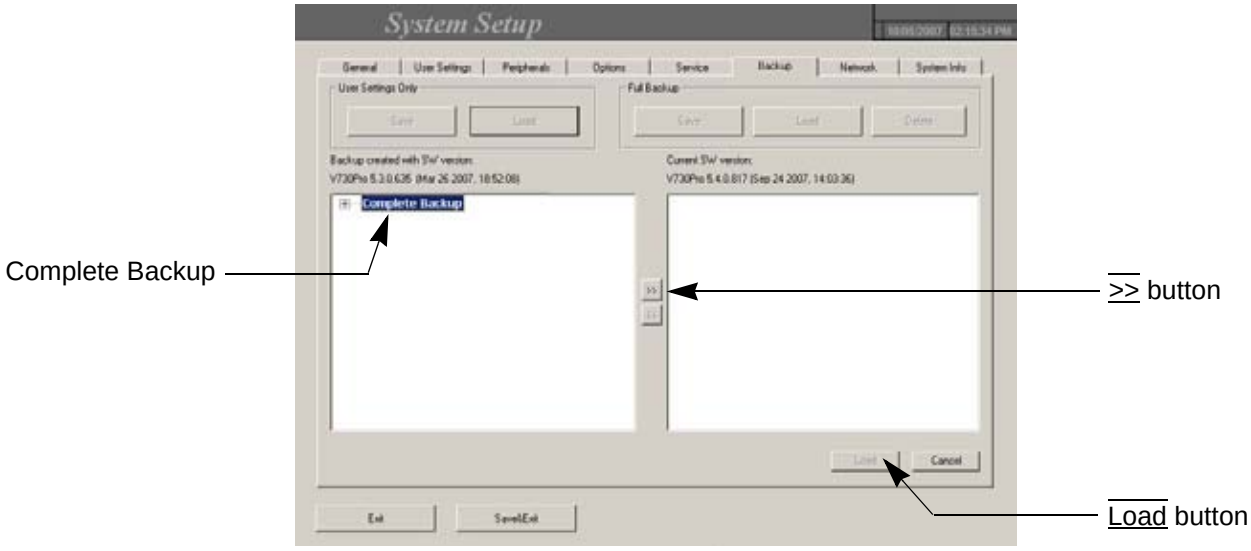


Figure 4-25 Load Backup Data

4-5-2 Load User Settings Only (Application Settings) (cont'd)

7.) Select the **Complete Backup** (marked blue; see: Figure 4-25) and click the >> button to copy the Complete Backup into the Load Data field.

8.) Click the LOAD button to start the loading procedure of the complete backup into the system.

NOTE: Also only parts of a User Settings Only "Backup" can be loaded into the database to overwrite, restore, copy, etc.... the database in the system.

1.) Click the + sign to open the content tree.

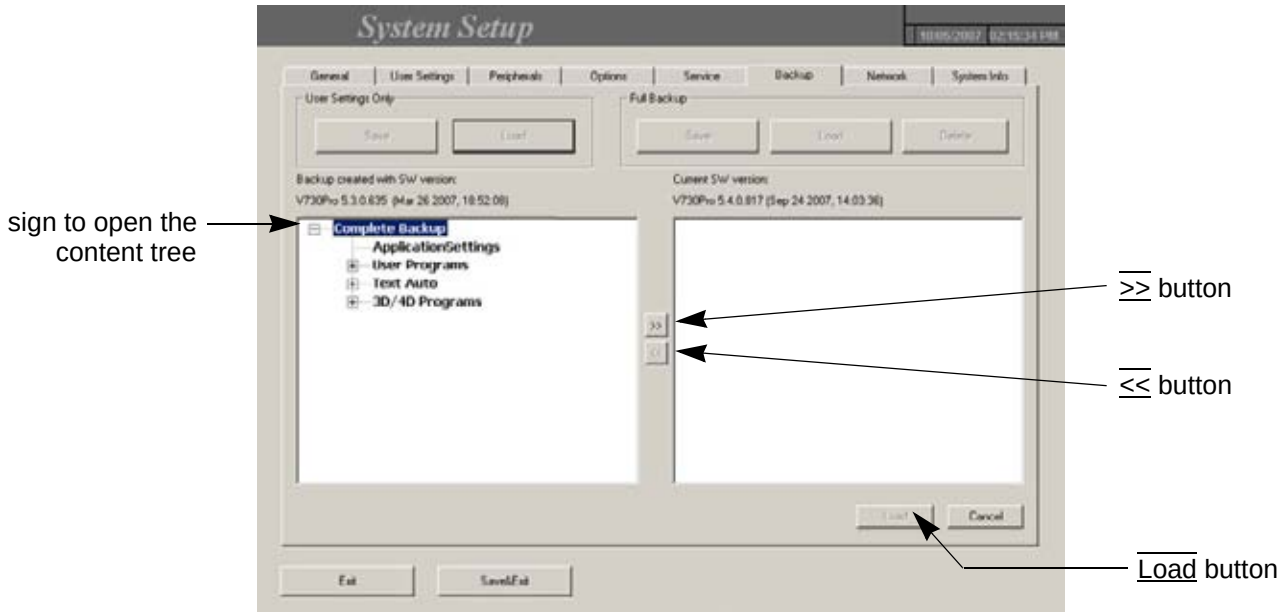


Figure 4-26 Load only parts of the Backup

2.) Click the >> button to copy the selected item into the Load Data field.

NOTE: To return selected items from the Load Data field to Backup Data field select the << button.

3.) Click the LOAD button to start loading procedure of the selected Backup item into the system.

4-5-3 Save Full Backup (Presets, Configurations & Application Settings)

A full backup always contains the following data

- Patient demographic and exam data (database containing the patient data and measurements)
- SonoView image data (**NOT** available when saving to the internal hard disk, DVD/CD or MOD)
- User Settings (databases and files containing gray curves and the user settings.)
- Image transfer settings (DICOM settings e.g., DICOM servers, AE Title, Station Name, etc.)
- Measure Setup Settings (user specific measure settings)
- V730 settings (general settings such as language, time/date format and the enabled options)
- Windows Network Settings (network settings including the computer name)
- Service Platform (state of the service platform)
- VP (additional system data)

CAUTION **It is recommended to create a full backup of the settings once a week.**

NOTE: Always "Full Backup" any presets, configurations and application settings to HDD and/or DVD or MO-disk before upgrading the software and/or application settings. This ensures that if the presets need to be reloaded, will be the same ones the customer was using prior to service.

1.) Press the **UTILITIES** key on the control panel. The menu area changes to the Utilities menu.
2.) Select the SYSTEM item from the menu area to activate the setup desktop screen.
3.) Select the BACKUP page and click the SAVE button of the "Full Backup" group.

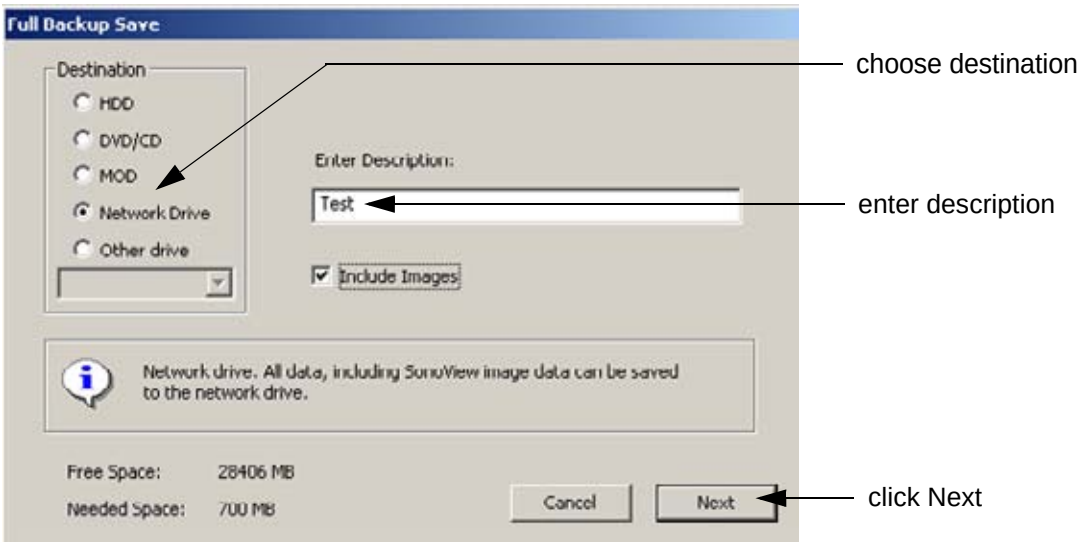


Figure 4-27 Full Backup Save

4.) Choose the Destination (e.g., Network Drive).
5.) Enter the description of the full backup.
6.) If desired and possible (Network Drive and Other drive **only**), activate "Include Images.

*NOTE: The "Include Images" option may result in a large amount of data: up to **70 Gigabytes**!*

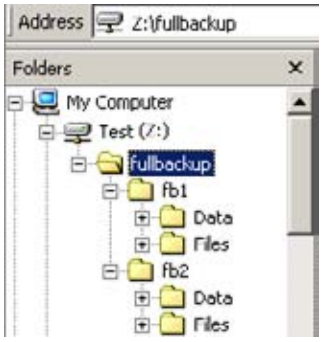
7.) Select the NEXT button to start the backup process.
After copying the data, the Voluson® 730Pro/ProV reboots and the application starts again.

4-5-3 Save Full Backup (Presets, Configurations & Application Settings) (cont'd)

When the Full Backup is stored on a network drive (to map a network drive see: Section 3-11-1 "Map Network Drive" on page 3-70), it may be desirable to move the data (e.g., for backup or maintenance).

The backups reside in sub folders of the main "*fullbackup*" -folder found at the root of the drive.
For Example: Backups on the mapped **Network Drive** are below path **Z:\fullbackup**.

The directory structure of the full backup data is as follows:

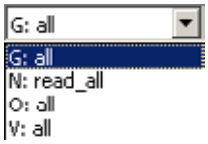


The sub folders have the names *fb**X*** where ***X*** is a number (e.g., Z:\fullbackup\fb1).

The data resides within a directory structure within these sub folders. It is possible to move the *fb**X*** sub folders, even leaving gaps in the numeration sequence.

However, **NO** change **MUST** be made to the contents of the *fb**X*** folders itself, otherwise the backup data cannot be restored!

Figure 4-28 directory structure of full backup data



If the destination „Other drive" is selected, the available drives (e.g., external USB-memory stick) can be chosen from the drop down menu.

Figure 4-29 "Other drive" drop down menu

NOTICE When the backup is saved to an external USB-device, the system has to be informed about the removal of the hardware. For this purpose every last dialog of "Full Backup Save" and "Full Backup Delete" has a STOP USB DEVICES button (see: Figure 4-30).

Figure 4-30 Please stop USB Devices before unplugging!

For further details review: Section 3-5-13 "External USB-Devices" on page 3-32.

4-5-4 Load Full Backup (Presets, Configurations & Application Settings)

WARNING ***Always backup any data before an upgrade; see: Section 4-5-3 on page 4-36.***

The "Full Backup" loading procedure replaces (overwrites) ALL the existing data on the local hard drive of the Voluson® 730Pro/ProV system!

CAUTION **There are circumstances where it is not possible to load (restore) all the data.**
The following rules specify the restrictions:

1.) Generally, **only** restoring data from an older to a newer software version is possible.
Loading a backup into a system that has a lower software version than the system the backup was created on is prohibited.

2.) Options can **only** be restored on the same Voluson® 730Pro/ProV system within the same major software version.

3.) When loading a backup into a system with a software version that has a higher major number (2.x.x -> 3.x.x -> 4.x.x -> 5.x.x), the following items will not be restored:

   A.) User Settings
   B.) Options
   C.) State of the Service Platform (new model type necessary for VOLC)

4.) The **user** is **only** allowed to restore data to a different system if and only if the software version on this system is the same as in the backup.

5.) The **user** is **only** allowed to restore data onto the same system if and only if the software version on this system is equal or higher than the version in the backup.

6.) The **user** is **not** allowed to restore the following items to a different system:

   A.) Windows Network Settings
   B.) Options
   C.) DICOM AE Title
   D.) DICOM Station Name
   E.) State of the Service Platform

4-5-4 Load Full Backup (Presets, Configurations & Application Settings) (cont'd)

1.) Press the **UTILITIES** key on the control panel. The menu area changes to the Utilities menu.
2.) Select the SYSTEM item from the menu area to activate the setup desktop screen.
3.) Select the BACKUP page and click the LOAD button of the "Full Backup" group.

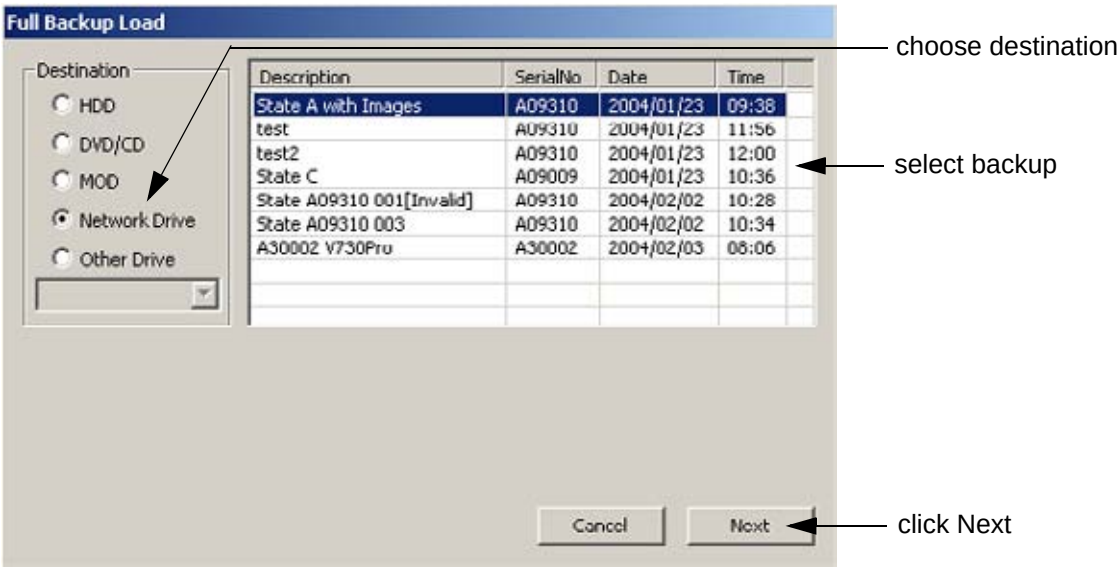


Figure 4-31 Full Backup Load

4.) Choose the Destination (e.g., Network Drive).
5.) Click on the backup to be restored (additional information is displayed in the table).
6.) Select the NEXT button. The following window will be displayed.

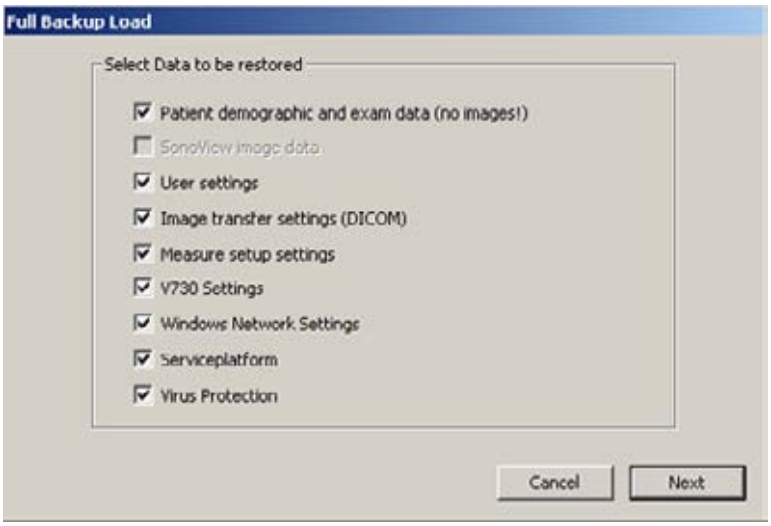


Figure 4-32 Select Data to be restored

7.) Select the data to be restored to the Voluson® 730Pro/ProV system and then click on NEXT.

NOTE: For description of the check box names review: A full backup always contains the following data

4-5-4 Load Full Backup (Presets, Configurations & Application Settings) (cont'd)

8.) Select YES to start, or NO to cancel the restore procedure.

Figure 4-33 Start Restore Backup now?

⚠ **WARNING** ***When clicking "YES", the current data on the system will be permanently replaced by the data of the backup and can not be restored!***

After restoring the data, the Voluson® 730Pro/ProV reboots and the application starts again.

4-5-5 Delete Full Backup (Presets, Configurations & Application Settings)

1.) Press the **UTILITIES** key on the control panel. The menu area changes to the Utilities menu.
2.) Select the SYSTEM item from the menu area to activate the setup desktop screen.
3.) Select the BACKUP page and click the DELETE button of the "Full Backup" group.

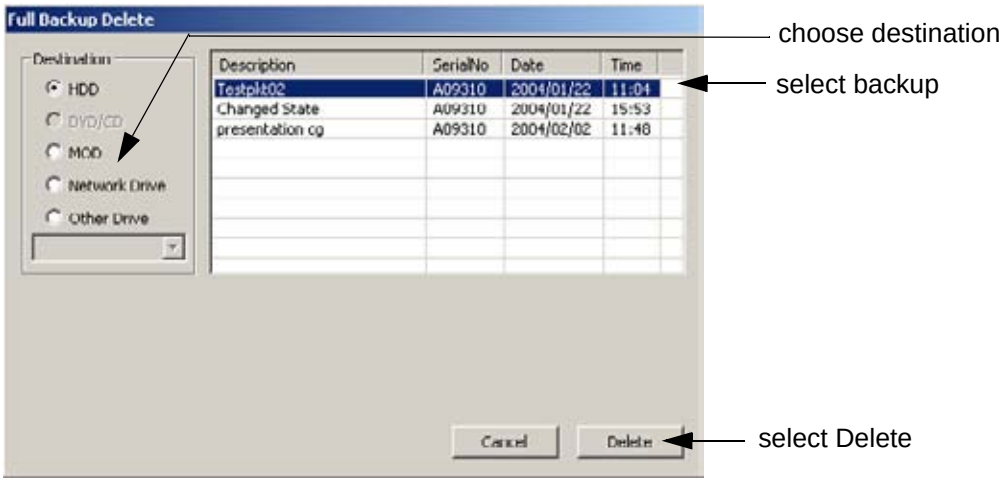


Figure 4-34 Full Backup Delete

4.) Choose the Destination (e.g., HDD = Hard disk).
5.) Click on the backup to be deleted (additional information is displayed in the table).
6.) Select the DELETE button.

⚠ **WARNING** ***There is no " UNDO" function for this action!***

4-5-6 Archiving Images

1.) Press the **SONOVIEW** key on the control panel.

2.) Insert the DVD/CD+(R)W or MOD into drive.
If required, format/erase the media, see Section 4-4-11-1 "Formatting Media" on page 4-30.

3.) When you click the OPEN button on the upper left side of the screen, a list of all the exams is displayed see Figure 4-35.

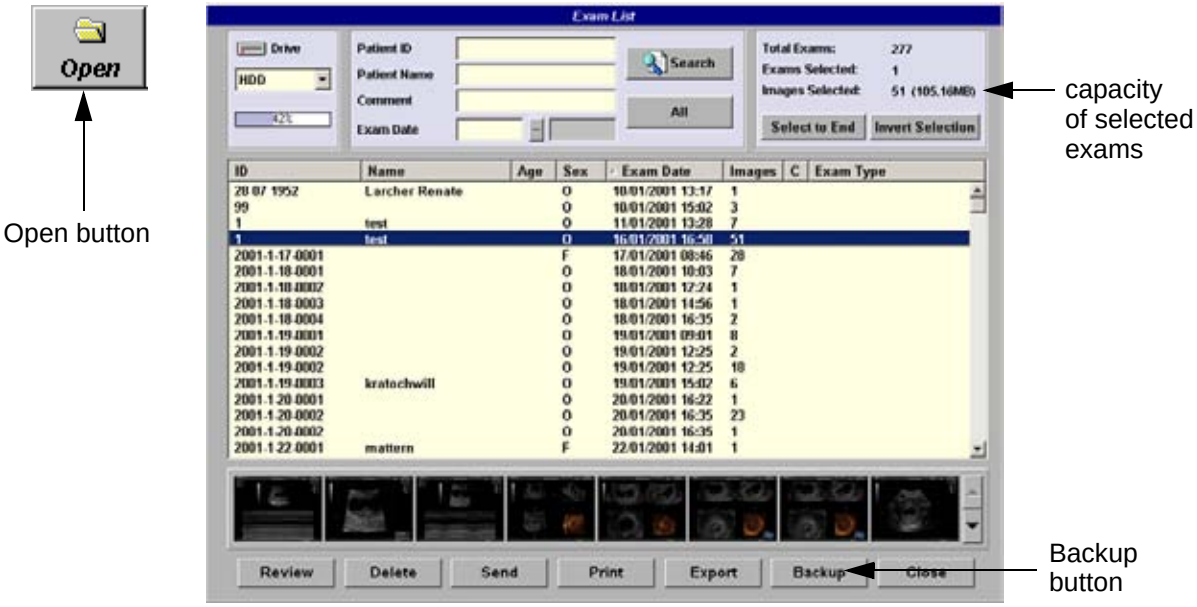


Figure 4-35 Sonoview Screen

4.) Select the exam(s) using the **TRACKBALL**, the **CTRL** or **SHIFT** key on the alphanumeric keyboard and the right trackball key **SET**.

The number of all exams, the number of currently selected exams, the number of images and the capacity of selected images are displayed automatically at the right and upper corner of the exams list.

5.) Click the BACKUP button.

6.) Select the destination for the backup.

NOTE: For destination NET perform Section 3-11-1 "Map Network Drive" on page 3-70 first.

7.) After finishing the backup, select whether the selected exam(s) is to be deleted or not.

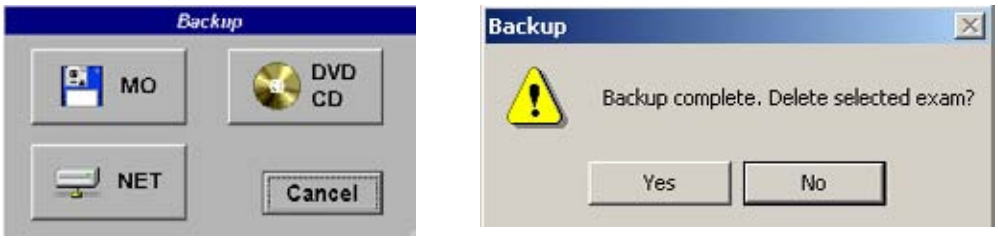


Figure 4-36 Backup windows

NOTICE If you select to delete the exam after finishing the backup, it will be absolutely deleted from the hard disk of the ultrasound scanner Voluson® 730Pro/ProV!

For further information refer to Chapter 15 in the Basic User Manual of Voluson® 730Pro/ProV.

Section 4-6
Software Configuration Checks

Press the **UTILITIES** key and select the SYSTEM item from the “Utilities” menu - which is shown in the menu area on the left side of the screen. The System Setup desktop offers different pages to check:

Table 4-10 Software Configuration (System Setup) Checks

Step	Task	Expected Result(s)
1	General: Check Date and Time setting	Date and Time are correct
2	General: Check that Location (Clinic Name) is correct	Location Name is correct
3	General: Check Language settings	desired Language is displayed
4	General: Check EUM Language settings	desired EUM Language is displayed
5	User Setting: Check all the User Settings	settings assigned as desired by the customer
6	User Settings: Check settings of the “Patient ID” field	settings assigned as desired by the customer
7	Peripherals: Check assignment of Printer keys	Print A and Print B keys are assigned as desired by the customer
8	Peripherals: Check assignment of Foot switch	Foot Switch left and right are assigned as desired by the customer
9	Peripherals: Check Save Destination assignment	assigned as desired by the customer
10	Peripherals: Check 2D Save key assignment	assigned as desired by the customer
11	Peripherals: Check Remote Print A, Remote Print B, Report Printer and DICOM Print Job assignment	settings assigned as desired by the customer
12	Option: Check that all options are set up correct	D = Demo , I = Inactive , P = Permanent
13	Network: Check DICOM, Sonoview and Network configurations	settings assigned as desired by the customer
14	Service: Check the Video Norm standard as described in Section 3-8-1-6 on page 3-63	settings assigned as required for the country

Press the **UTILITIES** key and select the MEASURE item from the “Utilities” menu - which is shown in the menu area on the left side of the screen.
The Measure Setup desktop offers three different pages to check.

NOTICE Parameters and possible adjustments depend on the selected Application.
To view, add, delete, reorder, edit or when creating a new parameter (in the **MEASURE & CALC** page), it is very important that all items are chosen correctly and that the relevant item is highlighted.

For further information refer to Chapter 18 in the Basic User Manual of Voluson® 730Pro/ProV.

Table 4-11 Measurement Setup Checks

Step	Task	Expected Result(s)
11	Measure & Calc: Check all settings for all applications	setting assigned as desired by the customer
2	Application Parameters: Check all settings for all applications	setting assigned as desired by the customer
3	Global Parameters: Check all settings	setting assigned as desired by the customer

Section 4-7
Peripheral Checks

Check that peripherals work as described below:

Table 4-12 Peripheral Checks

Step	Task to do	Expected Result(s)
1	Press the **FREEZE** key.	Stop image acquisition.
2	Press the **PRINT A** or **PRINT B** key on the Control Panel.	The image displayed on the screen is printed on printer, depending on the key assignment configuration
3	Press the **VCR** key on the Control Panel twice.	VCR resp.DVR starts recording (REC - will be displayed on the screen)
4	Press the **VCR** key twice again.	VCR resp.DVR stops recording
5	Press the **VCR** key on the Control Panel once.	The “VCR resp.DVR Remote Control” menu is displayed in the menu area as well as the status area on the screen.
6	Press the **RECORD** digipot or select the RECORD item from the menu area.	to start recording A red dot is displayed in the *VCR/DVR status area* on the *Title bar* to indicate that recording has begun.
7	Press the **STOP** digipot or select the STOP item from the menu area.	To Stop recording The video status icon is changed to (Pause)
8	Press the **PLAY** digipot or select the PLAY item from the menu area.	To start, Play back an examination
9	Press the **EXIT** key on the control panel.	to return to the scanning mode
10	Use the **assignable keys** on the control panel (their functions are shown in the status area) or select the **corresponding item** from the menu area on the screen.	to perform actions on the recorded session, such as stop, pause, rewind or fast forward. The video status icon is updated accordingly.

4-7-1 ECG Check Out

Connect the ECG preamplifier MAN and check:

Table 4-13 ECG preamplifier Check

Step	Task	Expected Result(s)
1	Connect the ECG at the Connector on the rear panel of the scanner. Press the **ECG** key on the control panel to display the “ECG” menu on in the screen.	It will display a curve along the bottom edge of the image sector

4-7-2 Power Supply Adjustment

There are no adjustments on the power supplies. The DC Power is self-regulated. If a voltage is outside the specified range, it means that something is wrong, either with the power supply itself or with a component connected to that specific power outlet.

Section 4-8
Mechanical Function Checks

4-8-1 Rotation of the Control Console

Figure 4-37 locking lever under Control Console

Table 4-14 Rotation of the Control Console

Step	Task	Expected Result(s)
1	Pull the locking lever under the Control Console forward, grasp it at the front grip and rotate the console.	It is possible to rotate the Control Console up to 30° to the right.

WARNING ***Do not put your hand between the control console and the main unit when moving the console to the 0 position: Danger of injuries!***

4-8-2 Brakes and Direction Locks

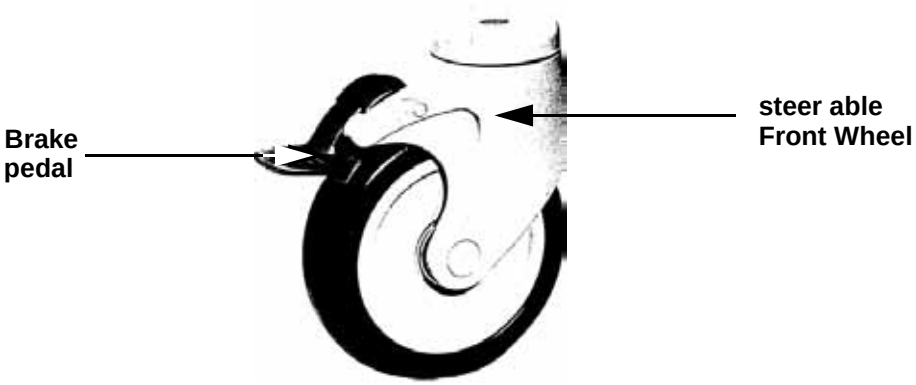


Figure 4-38 Front Wheel with Brake

Table 4-15 Brakes and Direction Lock

Step	Task	Expected Result(s)
1	Flap the foot rest up and press the release brake pedals on the front wheels.	The front wheels are engaged / disengaged for transportation.

Section 4-9
Site Log

4-9-1 Site Log - System (Service Database)

1.) Press the **UTILITIES** key on the Control Panel. The menu area changes to the Utilities menu.
2.) Select the SYSTEM item from the menu area to activate the setup desktop screen.
3.) Select the SERVICE page. The “password window” appears automatically.
4.) Enter the password SHE and click the ACCEPT button to display the Service Tools window.

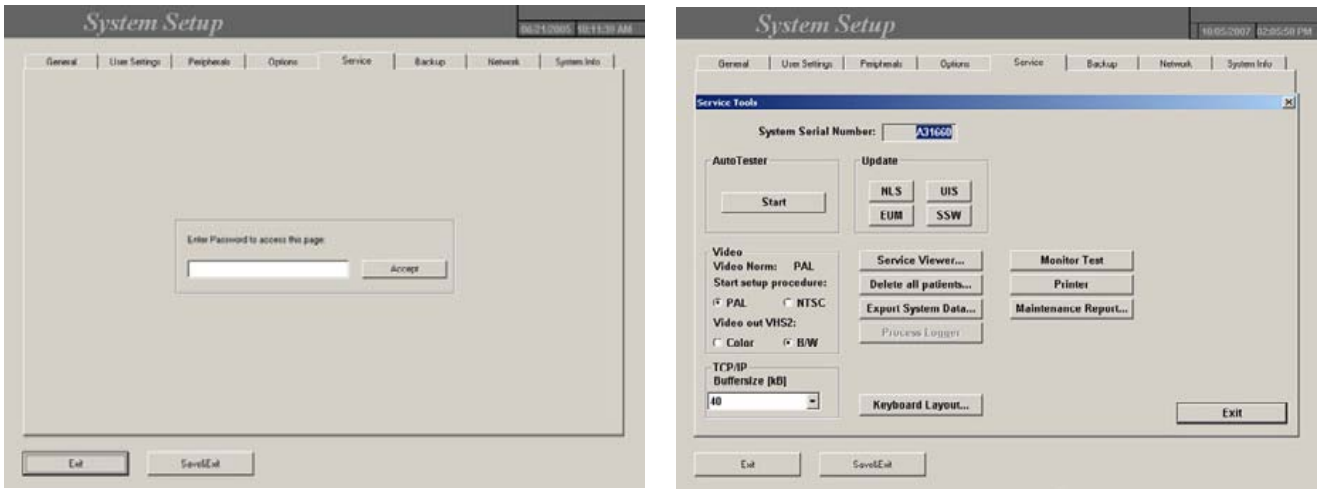


Figure 4-39 System Setup Service page and Service Tools window

5.) Click the MAINTENANCE REPORT button. The following message box will be displayed.

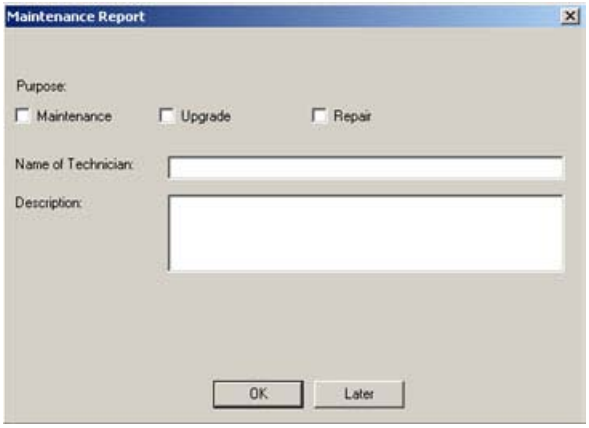


Figure 4-40 Maintenance Report

6.) Fill in the requested information and click OK.
7.) Click the EXIT button on the Service Tools window and the EXIT button on the System Setup Service page.

NOTE: After Hardware or Software modifications normally the “Maintenance Report” message box (Figure 4-40) appears automatically on the screen.

4-9-2 Site Log - Paper Documentation

Table 4-16 Site Log

Date	Service person	Problem	Comments

Chapter 5
Components and Functions (Theory)

Section 5-1
Overview

5-1-1 Purpose of Chapter 5

This chapter explains Voluson® 730Pro/ProV's system concepts, component arrangement, and subsystem function. It also describes the Power Distribution System (PDS) and probes.

Table 5-1 Contents in Chapter 5

Section	Description	Page Number
5-1	Overview	5-1
5-2	General Information	5-2
5-3	Main board Chassis - GEZ Module	5-21
5-4	FrontEnd Processor	5-22
5-5	BackEnd Processor	5-28
5-6	Internal I/O	5-32
5-7	Top Console	5-41
5-8	Monitor	5-46
5-9	External I/O	5-47
5-10	Peripherals	5-48
5-11	Power Distribution	5-49
5-12	Mechanical Descriptions	5-51
5-13	Air Flow Control	5-54
5-14	Service Platform	5-55
5-15	Service Page	5-57

Section 5-2
General Information

Voluson® 730Pro/ProV is a digital beamforming curved-, linear- and phased array ultrasound imaging system. It has provisions for analog input sources like ECG and Phono.
A CW-Doppler probe may also be connected and used.

The system can be used for:

- 2D Mode and Color Doppler Imaging (CFM, PD and TD)
- M Mode + MCFM Imaging
- Doppler (PW, CW)
- 3D Mode and Real Time 4D Imaging
- Different combinations of the above modes

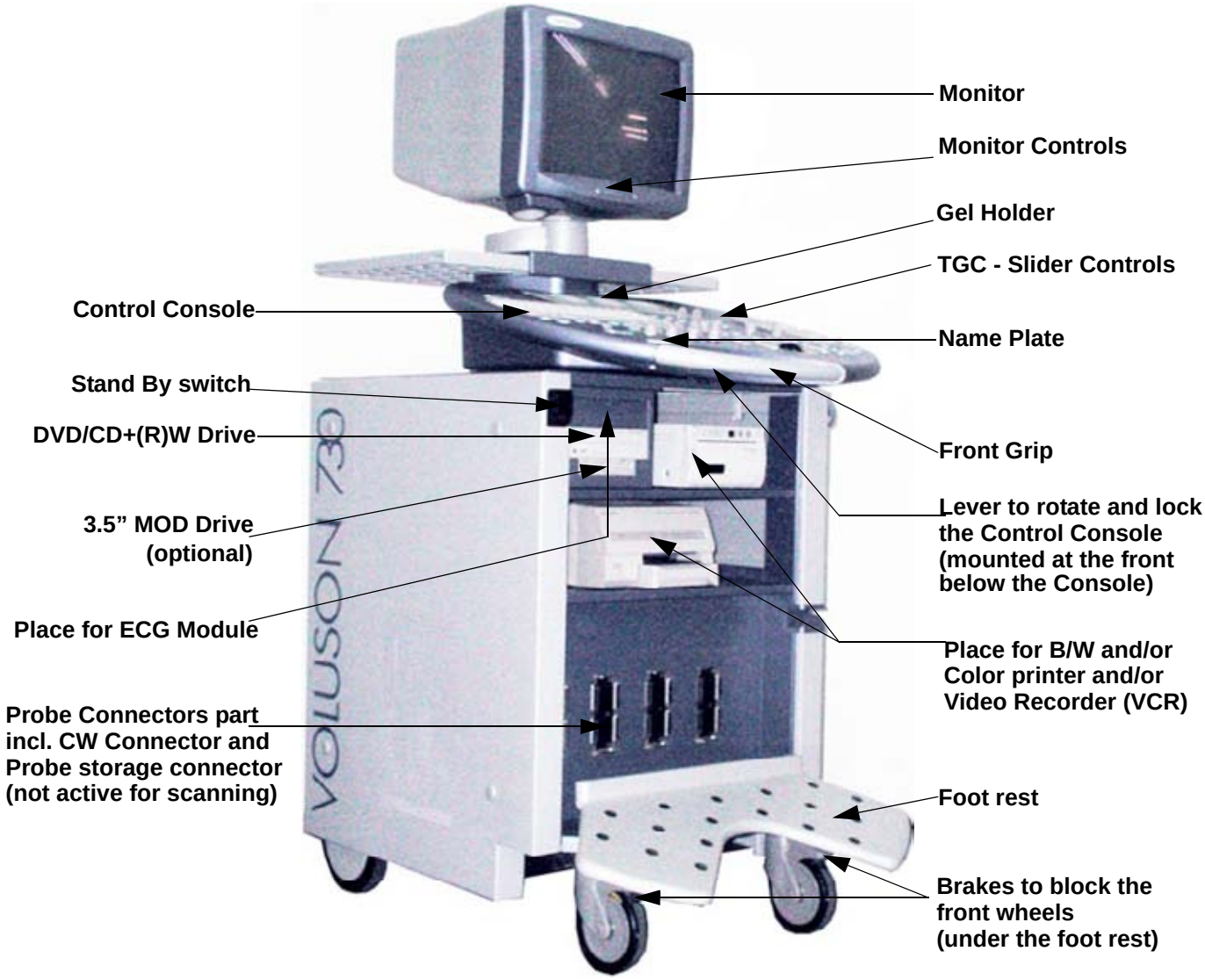

Monitor
Monitor Controls
Gel Holder
TGC - Slider Controls
Control Console
Name Plate
Stand By switch
DVD/CD+(R)W Drive
Front Grip
Lever to rotate and lock the Control Console (mounted at the front below the Console)
3.5” MOD Drive (optional)
Place for ECG Module
Place for B/W and/or Color printer and/or Video Recorder (VCR)
Probe Connectors part incl. CW Connector and Probe storage connector (not active for scanning)
Foot rest
Brakes to block the front wheels (under the foot rest)
VOLUSON 730

Figure 5-1 Voluson® 730Pro/ProV Major Components

Section 5-2 General Information (cont'd)

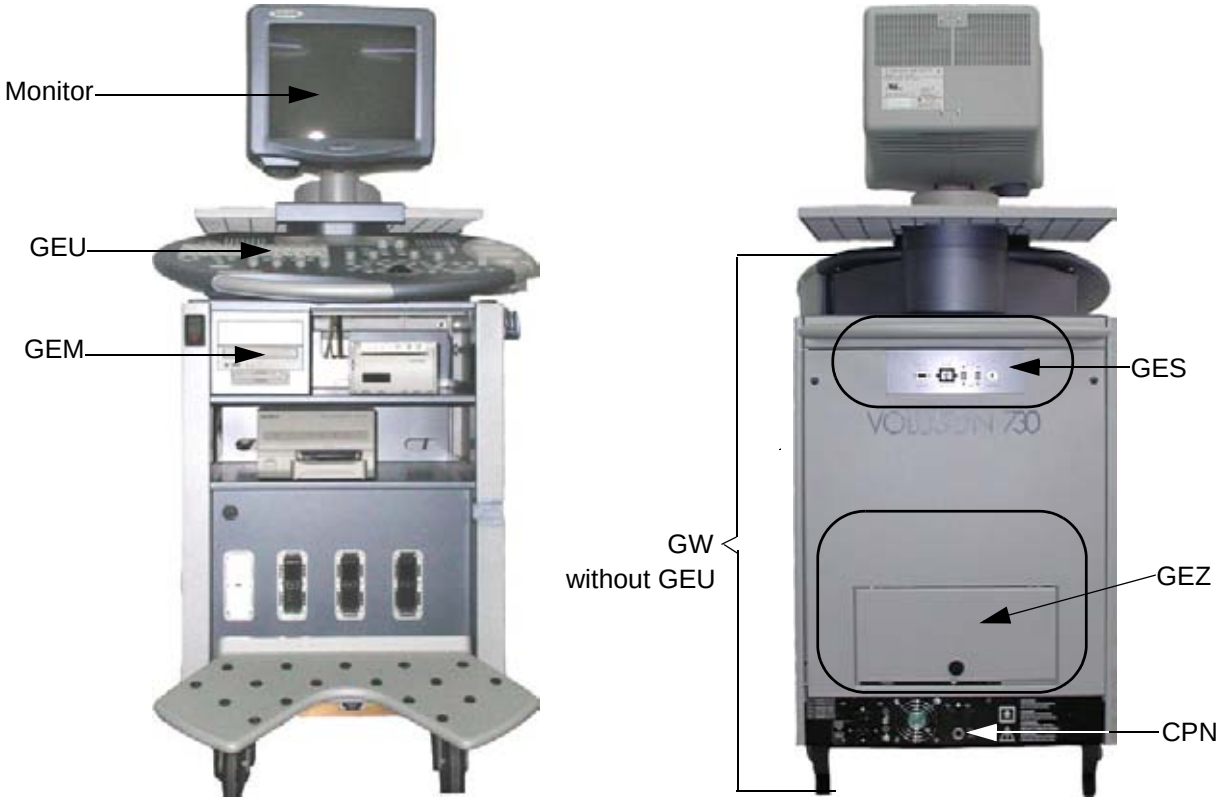


Figure 5-2 Major System Components

Major System Components:

- GEZ: Main Board Chassis: Section 5-3 on page 5-21
  - Front-End processor: Section 5-4 on page 5-22
  - Back-End processor: Section 5-5 on page 5-28
- GEU: Top Console User interface (System I/O with hard keys) Section 5-7 on page 5-41
- Monitor: Section 5-8 on page 5-46
- GES: External I/O Connection Module Section 5-8 on page 5-46
- GEM: Removable Disk drive module (MO-Drive and ECG-preamplifier - optional) Section 5-10 on page 5-48
- CPN: Primary Power supply and Isolation transformer for the peripherals Section 5-11 on page 5-49
- GW: System mechanical chassis, stand alone trolley to keep all major components Section 5-12 on page 5-51

Section 5-2 General Information (cont'd)

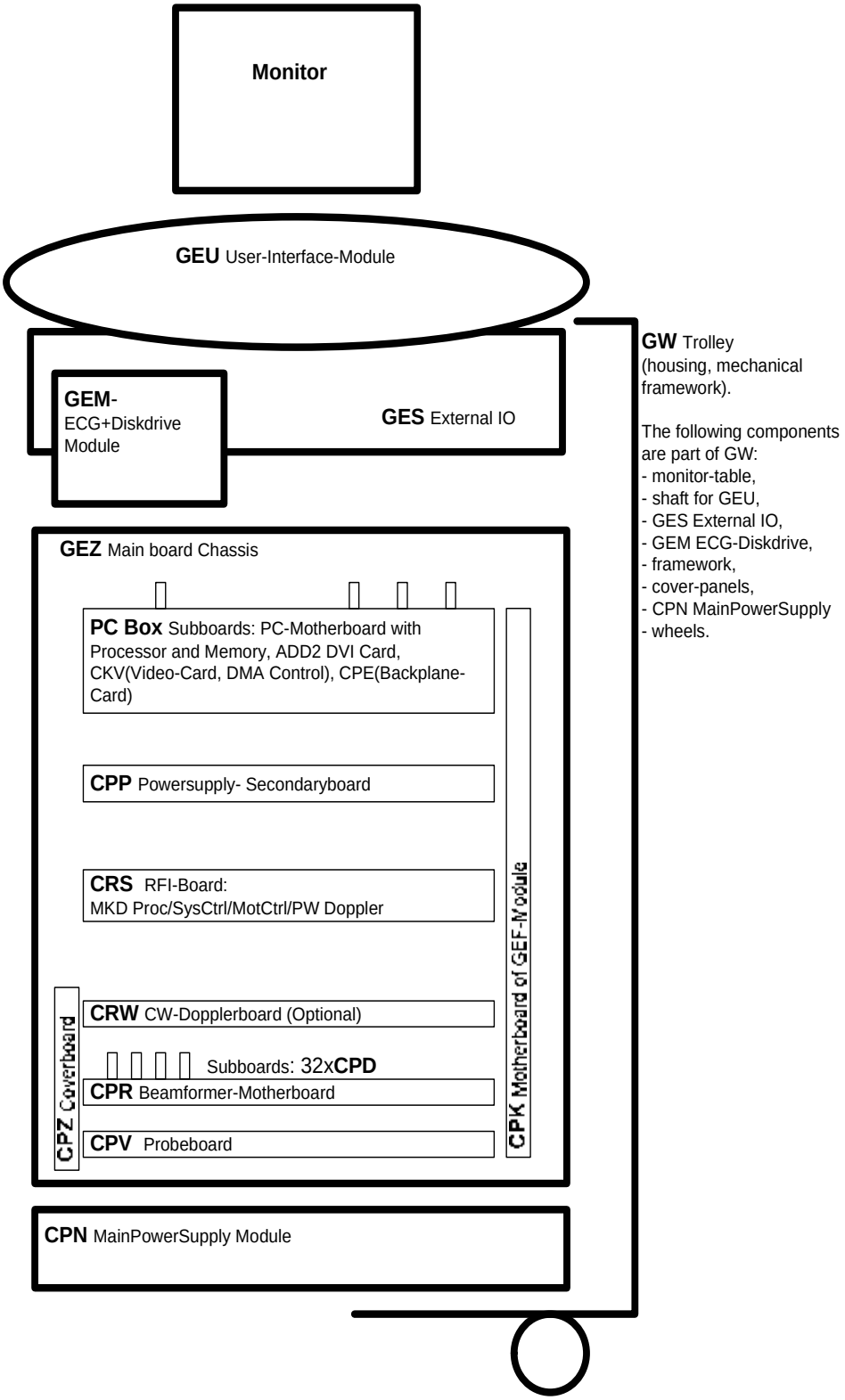


Figure 5-3 Basic Block diagram of Voluson® 730Pro/ProV

Section 5-2 General Information (cont'd)

The Voluson® 730Pro/ProV used digital beamforming technology which provides high resolution and high penetration performance. It is a general purpose, mobile, software controlled diagnostic ultrasound scanner. Its function is to acquire ultrasound data and to display the data of different modes. Voluson® 730Pro/ProV gives the operator the ability to measure anatomical structures and offers analysis packages that provide information that is used to make a diagnosis by competent health care professionals.

The Calculation and Report function supports following application packages:

- Abdomen (ABD)
- Obstetrics (OB)
- Gynecology (GYN)
- Cardiology (CARD)
- Urology (URO)
- Vascular (VAS)
- Neurology (NEURO)
- Small Parts (SM P)
- Pediatrics (PED)
- Orthopedics (ORTHO)

The Voluson® 730Pro/ProV supports a variety of linear-, curved-, phased array and pencil probes for various clinical applications. Any 3 probes may be connected at the same time (+ 1 pencil CW-probe).

Medical application fields include:

- Obstetrics
- Gynecology and Fertility
- Radiology
- Internal Medicine
- Neurology
- Cardiology
- Oncology
- Urology
- Orthopedics
- Pediatrics

The system is designed for follow-up expansion.

In addition to the initial operational settings for each transducer pre-programmed in the system, user-customized parameter settings for each transducer may be inserted by the operator and stored for recall as needed via the system control panel. System configuration is stored on the hard drive and all necessary software is loaded from the hard drive on power up.

Biopsy guidelines are provided on screen to assist in the collection of tissue samples, using biopsy guide adapters offered as an optional accessory.

The system provides the ability to perform remote viewing of images without compression, via DICOM 3.0 compatible output. Management of patient history is possible by "Sonoview" image-filing function. High-resolution images are provided by utilizing a technology called digital dynamic receive focusing.

Section 5-2 General Information (cont'd)

Signal flow travels from the Probe Connector Panel to the Front End Electronics, to the Back-End Processor, and finally displayed on the monitor and peripherals.

For more detailed explanations of functions and controls refer to the Voluson® 730Pro/ProV Basic User Manual.

5-2-1 Description of Voluson® 730Pro/ProV Operating Modes

5-2-1-1 B-Mode or 2D-Mode

B-Mode or 2D-mode is a two-dimensional image of the amplitude of the echo signal. It is used for location and measurement of anatomical structures and for spatial orientation during operation of other modes. In 2D-mode, a two-dimensional cross-section of a three-dimensional soft tissue structure such as the heart is displayed in real time. Ultrasound echoes of different intensities are mapped to different gray scale or color values in the display. The outline of the 2D cross-section may be a rectangle, parallelogram, sector or 360-degree circle, depending on the particular transducer used.
2D-mode can be used in combination with any other mode.

5-2-1-1-1 Coded Harmonic Imaging (HI)

In Harmonic Imaging, acoustic aberrations due to tissue are minimized by receiving and processing the second harmonic signal that is generated within the insonified tissue. Voluson® 730Pro/ProV´s high performance HI provides superb detail resolution and penetration, outstanding contrast resolution, excellent acoustic clutter rejection and an easy to operate user interface.
Coded Harmonics enhances near field resolution for improved small parts imaging as well as far field penetration. It diminishes low frequency amplitude noise and improves imaging technically difficult patients. It may be especially beneficial when imaging isoechoic lesions in shallow-depth anatomy in the breast, liver and hard-to-visualize fetal anatomy.
Coded Harmonics may improve the B-Mode image quality without introducing a contrast agent.

5-2-1-2 M-Mode

In M-mode, soft tissue structure is presented as scrolling display, with depth on the Y-axis and time on the X-axis. It is used primarily for cardiac measurements such as value timing on septal wall thickness when accurate timing information is required. M-mode is also known as T-M mode or time-motion mode. Ultrasound echoes of different intensities are mapped to different gray scale values in the display. M-mode displays time motion information of the ultrasound data derived from a stationary beam. Depth is arranged along the vertical axis with time along the horizontal axis. M-mode is normally used in conjunction with a 2D image for spatial reference. The 2D image has a graphical line (M-line) superimposed on the 2D image indicating where the M-mode beam is located.

5-2-1-2-1 MCFM Mode (M Mode + Color Flow Mode)

Color Flow Mode and Color M Mode are Doppler modes intended to add color-coded qualitative information concerning the relative velocity and direction of fluid motion within the 2D mode or M mode image. Color Flow overlays color on the M mode trace using velocity and variance color maps. The Color Flow wedge overlays the 2D mode image and M mode timeline.

5-2-1-3 Color Doppler Modes

Color Doppler is used to detect motion presented as a two-dimensional display. There are following applications of this technique:

- Color Flow Mode (C) - used to visualize blood flow velocity and direction
- Power Doppler (PD) - used to visualize the spatial distribution of blood
- Tissue Doppler (TD) - used to visualize tissue motion direction and velocity

5-2-1-3-1 Color Flow Mode

A real-time two-dimensional cross-section image of blood flow is displayed. The 2D cross-section is presented as a full color display, with various colors being used to represent blood flow (velocity, variance, power and/or direction). Often, to provide spatial orientation, the full color blood flow cross-section is overlaid on top of the grayscale cross-section of soft tissue structure (2D echo). For each pixel in the overlay, the decision of whether to display color (Doppler), gray scale (echo) information or a blended combination is based on the relative strength of return echoes from the soft tissue structures and from the red blood cells. Blood velocity is the primary parameter used to determine the display colors, but power and variance may also used. A high pass filter (wall filter) is used to remove the signals from stationary or slowly moving structures. Tissue motion is discriminated from blood flow by assuming that blood is moving faster than the surrounding tissue, although additional parameters may also be used to enhance the discrimination. Color flow can be used in combination with 2D and Spectral Doppler modes as well as with 3D mode.

5-2-1-3-2 Power Doppler

A real-time two dimensional cross-section of blood flow is displayed. The 2D cross-section is presented as a full color display, with various colors being used to represent the power in blood flow echoes. Often, to provide spatial orientation, the full color blood flow cross-section is overlaid on top of the gray scale cross-section of soft tissue structure (2D echo). For each pixel in the overlay, the decision of whether to display color (Doppler power), gray scale (echo) information or a blended combination is based on the relative strength of return echoes from the soft-tissue structures and from the red blood cells. A high pass filter (wall filter) is used to remove the signals from stationary or slowly moving structures. Tissue motion is discriminated from blood flow by assuming that blood is moving faster than the surrounding tissue, although additional parameters may also be used to enhance the discrimination. The power in the remaining signal after wall filtering is then averaged over time (persistence) to present a steady state image of blood flow distribution. Power Doppler can be used in combination with 2D and Spectral Doppler modes as well as with 3D mode.

5-2-1-3-3 Tissue Doppler

The Tissue Color Doppler Imaging is used for color encoded evaluation of heart movements. The TD image provides information about tissue motion direction and velocity.

5-2-1-4 Pulsed (PW) Doppler

PW Doppler processing is one of two spectral Doppler modalities, the other being CW Doppler. In spectral Doppler, blood flow is presented as a scrolling display, with flow velocity on the Y-axis and time on the X-axis. The presence of spectral broadening indicates turbulent flow, while the absence of spectral broadening indicates laminar flow. PW Doppler provides real time spectral analysis of pulsed Doppler signals. This information describes the Doppler shifted signal from the moving reflectors in the sample volume. PW Doppler can be used alone but is normally used in conjunction with a 2D image with an M-line and sample volume marker superimposed on the 2-D image indicating the position of the Doppler sample volume. The sample volume size and location are specified by the operator. Sample volume can be overlaid by a flow direction cursor which is aligned, by the operator, with the direction of flow in the vessel, thus determining the Doppler angle. This allows the spectral display to be calibrated in flow velocity (m/sec.) as well as frequency (Hz). PW Doppler also provides the capability of performing spectral analysis at a selectable depth and sample volume size. PW Doppler can be used in combination with 2D and Color Flow modes.

5-2-2 3D Imaging

The Voluson® 730Pro/ProV Ultrasound System will be used to acquire multiple, sequential 2D images which can be combined to reconstruct a three dimensional image. These 3D images are useful in visualizing three-dimensional structures, and in understanding the spatial or temporal relationships between the images in the 2D sequence. The 3D image is presented using standard visualization techniques, such as surface or volume rendering.

5-2-2-1 3D Data Collection and Reconstruction

2D gray scale images including Color Flow or Power Doppler information may be reconstructed. The acquisition of volume data sets is performed by sweeping 2D-scans with special transducers (called 3D-transducers) designed for the 2D-scans and the 3D-sweep.

2D ultrasound imaging modes are used to view a two dimensional cross-sections of parts of the body. For example in 2D gray scale imaging, a 2 dimensional cross-section of a 3-dimensional soft-tissue structure such as the heart is displayed in real time. Typically, the user of an ultrasound machine manipulates the position and orientation of this 2D cross-section in real time during an ultrasound exam.

By changing the position of the cross-section, a variety of views of the underlying structure are obtained, and these views can be used to understand a 3-dimensional structure in the body.

To complete survey a 3-dimensional structure in the body, it is necessary to collect 2D images which span a volume containing the structure. One way is to sweep the imaging cross-section by translating it in a direction perpendicular to the cross-section. Another example method is to rotate the cross section about a line contained in the cross section. The Voluson® 730Pro/ProV Ultrasound System uses the automated so called C-Scan for the motion perpendicular to automated B-scan. Once a representative set of 2D cross-sections are obtained, standard reconstruction techniques can be used to construct other 2D cross-sections, or to view the collection of the cross-sections as a 3D images.

5-2-2-2 3D Image Presentation

Several techniques can be used to aid the human observer in understanding the resulting 2D image as a representation of a three-dimensional object. One is to rotate the volume of data, and present the resulting sequence of 2D projections to the observer. The changing direction of observation helps the observer to separate the features in the volume according to their distance from the observer.

5-2-2-3 3D Rendering

The 3D (volume) rendering is a calculation process to visualize certain 3D-structures of a scanned volume by means of a 2D-image. The gray value for each pixel of the 2D-image is calculated from the voxels along the corresponding projection path (analyzing beam) through the volume. The render (calculation) algorithm, surface or transparent mode, determines how 3D-structures are visualized.

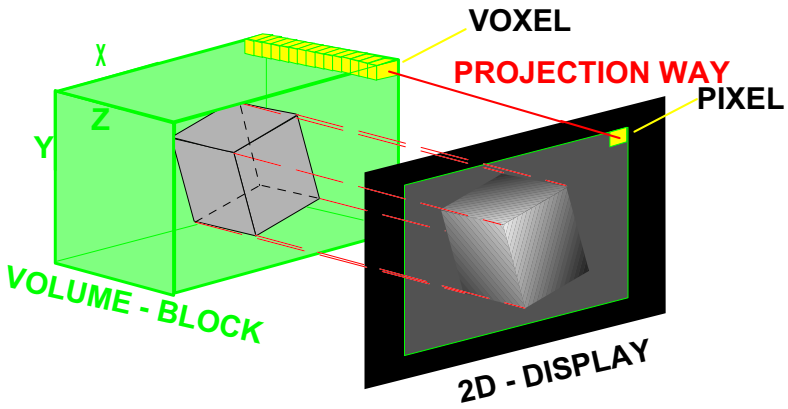


Figure 5-4 Principle: Volume Rendering

5-2-3 Block diagram Voluson® 730Pro/ProV

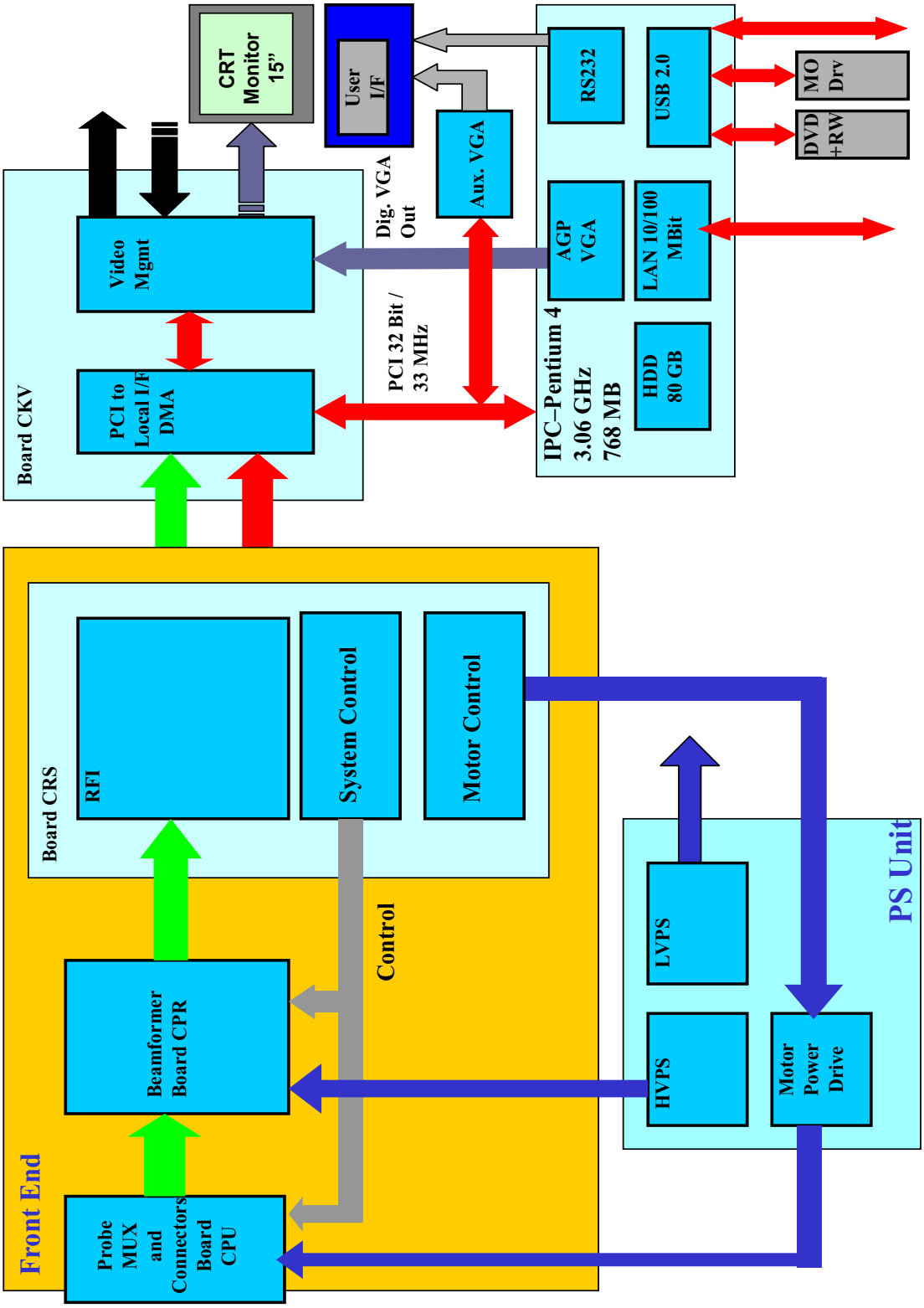


Figure 5-5 Top Level Architecture

5-2-3 Block diagram Voluson® 730Pro/ProV (cont'd)

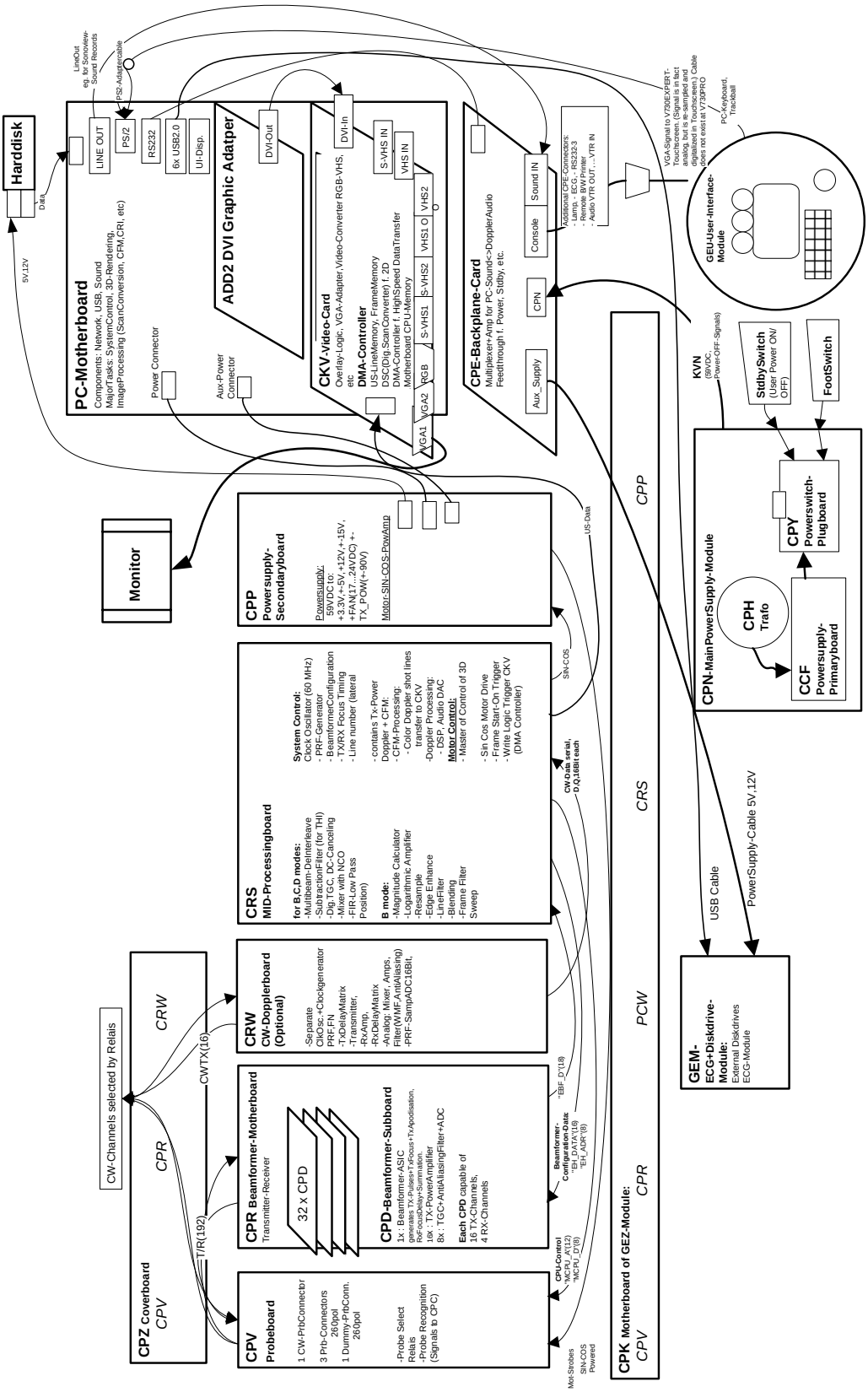


Figure 5-6 Voluson® 730Pro/ProV - Block diagram

5-2-4 Data Flow Control Description

This section describes functions of Voluson® 730Pro/ProV Boards vs different Operation Modes.

- CPR - Beam former Board
- CRS - Mid-Processor, System Control and Spectral Doppler Audio Board
- CKV - DMA Controller / Video Management Board

(CKV-Block diagram) see Figure 5-16 on page 5-29

5-2-4-1 B-Mode

1.) CRS

The CRS contains the Clock-Oszillator(60MHz) and PRF-Generator.
It generates(drives) BF(=Beamformer)-ASIC-Clock(60MHz) and Shot-Trigger for the CPR.
Configures CPV (Probe board) and Beamformer (CPD-Subboards on CPR) with TX-Frequ, TX-Focus, RX-Focus, LineNo (lateral Position), TX- Apodisation, RX-Apodisation, Multibeam, etc.
CRS also contains the TX-Power-Reference-DAC.

Furthermore it contains Multibeam-DeInterleave, Subtraction Filter (for HI-Mode, see: Section 5-2-4-1-1 "Special B-Mode Techniques" on page 5-12, DigitalTGC, DC-Canceler, Mixer (Part of Demodulator), LowPassFilter, Decimation (Pixel rate Conversion), Magnitude Calculator (Part of Demodulator), Logarithmic Amplifier, Re-Sample, Edge Enhance (Contrast Enhancement through differentiation), LineFilter, Blending (adapting Brightness in order to perfectly combine Nearfield-Frame with Farfield-Frame in FFC-Mode, see: Section 5-2-4-1-1 "Special B-Mode Techniques" on page 5-12, FrameFilter.

Multibeam-DeInterleave means: Incoming Pixel order
shot1**pix1**-shot2**pix1**-shot3**pix1**-shot4**pix1** -
shot1**pix2**-shot2**pix2**-shot3**pix2**-shot4**pix2**...
is converted to the new order:
shot1pix1-**shot1**pix2-**shot1**pix3..... - **shot2**pix1-**shot2**pix2-**shot2**pix3.....

After DC-cancelling the signal is mixed with RX-Frequency and brought to LF-Spectrum, where the LowPassFilter cuts HF. Mixer and Magnitude-Calculator arrange Complex Demodulation, and Logarithmic Amplifier arrange the conversion from High-Dynamic LinearSignal to the Low-Dynamik(e.g.8Bit) Log-Signal. Several Postprocessing steps (LineFilter, FrameFilter, ReSample, Edge Enhance) enable smooth image quality while keeping contrast high.

2.) CPR

Contains 32 CPD (Beamformer-Subboards).
The CPD consists of Beamformer-ASIC, TX-Amplifier, RX-TGC-Amplifier, Signal-ADC.
Each CPD can support 8 TX-Channels and 4 RX-Channels.

- TX-Channel: ASIC generates TX-Freq through dividing 60MHz by 2,3,4,5,... and TX-Focus.
- RX-Channel: ASIC generates Sample-Clocks for the ADC, manages RX-Focus (Delay and Chain-Adder) and Apodization.

3.) CKV - Direct Memory Access (DMA) section

B-mode-Data from CRS is written via Signal Processor (SP) Channel 0 into SDRAM Fifo Buffer memory. DMA Controller 0 transfers the data into PC main memory where scan conversion is performed per software.
Cine Mode: Reserved area in PC main memory is used.

4.) CKV - Video section

Video Information is provided by the PC on the DVI (Digital Visual Interface) output connector. The signal is connected to CKV, where the analog VGA signals for the monitor and standard video timing outputs are generated.

5-2-4-1-1 Special B-Mode Techniques

a.) **HI** (Coded Harmonic Imaging):
In one method of HI the RX-Frequency is doubled, so that the radial resolution is increased due to the higher RX-Frequency.
The second method of HI is pulse-inversion: 2 TX-Beams are shot to the same Tissue-location, one with positive, one with negative polarity. The subtraction of both shots (Subtraction Filter) brings to bear the nonlinear-echo-reflection-properties of the tissue (especially in usage of Contrast-medias), which is very useful with extremely difficult-to-image patients.

b.) FFC (Frequency and Focus Composite):
2 or more TX-Beams are shot to the same Tissue-location. The Beams have different TX-foci. By means of Blending (adaption of Brightnesses) they are composed to one whole RX-Line.

c.) XBEAM CRI (CrossBeam - Compound Resolution Imaging):
Does not need any special functions of CRS.
Image is composed of more than one different-direction-steered images. PC-calculated.

5-2-4-2 M-Mode

1.) CRS

see: 5-2-4-1 B-Mode

2.) CPR

see: 5-2-4-1 B-Mode

3.) CKV - DMA section

B-mode-Data from CRS is written via SP0 into SDRAM Fifo Buffer memory.
DMA Controller 1 transfers the data into PC main memory where scan conversion is performed per software, i.e. the sweep image is generated (scaling and interpolation between lines).
CineMode: CineMode-Memory is the PC main memory.
CineMode with ECG: CineMode-Memory for the ECG-Curve is inside PC-Memory.
Software has to take care that M-Mode-Image and ECG-Curve are placed exactly one upon the other, means: have the same Cine-Shift.

4.) CKV - Video section

see: 5-2-4-1 B-Mode

5-2-4-3 D-Mode (Pulsed Wave- and Continuous Wave Doppler)

1.) CRS

- PRF-generator; see: 5-2-4-1 B-Mode
- After DC-cancelling the signal is mixed with RX-Frequency and brought to LF-Spectrum, where the LowPassFilter cuts HF.
  Mixer and Magnitude-Calculator arrange Complex Demodulation.
- D-Mode Data uses the dedicated 16-bit Bus SP0 to the CKV.

2.) CPR

see: 5-2-4-1 B-Mode

3.) CKV - DMA section

D-mode-Data from CRS is written via SP0 into SDRAM Fifo Buffer memory.
DMA Controller 1 transfers the data into PC main memory where FFT and scan conversion is performed per software, i.e. the sweep image is generated (scaling and interpolation between lines).
CineMode: CineMode-Memory is the PC main memory.
CineMode with ECG: CineMode-Memory for the ECG-Curve is inside PC-Memory.
Software has to take care that D-Mode-Image and ECG-Curve are placed exactly one upon the other, means: have the same Cine-Shift.

4.) CKV - Video section

see: 5-2-4-1 B-Mode

5-2-4-4 D-Mode Autotrace (draws PC-calculated envelope to D-Spectrum) (ECG-Curve is similar to Autotrace-Curve)

1.) CRS

- PRF-generator; see: 5-2-4-1 B-Mode
- After DC-cancelling the signal is mixed with RX-Frequency and brought to LF-Spectrum, where the LowPassFilter cuts HF.
  Mixer and Magnitude-Calculator arrange Complex Demodulation.
- D-Mode Data use the dedicated 16-bit Bus SP0 to the CKV.

2.) CPR

see: 5-2-4-1 B-Mode

3.) CKV - DMA section

D-mode-Data from CRS is written via SP0 into SDRAM Fifo Buffer memory.
PC calculates Autotrace-Curve from D-Mode data.
Cine Mode with Autotrace/ECG: Cine Mode-Memory for the Autotrace/ECG-Curve is inside PC-Memory.
Software has to take care that D-Spectrum and Autotrace/ECG-Curve are placed exactly one upon the other, means: have the same Cine-Shift.

4.) CKV - Video section

see: 5-2-4-1 B-Mode

5-2-4-5 CFM-Mode (Color Flow Mode)

1.) CRS

- PRF-generator; see: 5-2-4-1 B-Mode
- After DC-cancelling the signal is mixed with RX-Frequency and brought to LF-Spectrum, where the LowPassFilter cuts HF.
  Mixer and Magnitude-Calculator arrange Complex Demodulation.

2.) CPR

see: 5-2-4-1 B-Mode

3.) CKV - DMA section

see: 5-2-4-1 B-Mode

4.) CKV - Video section

see: 5-2-4-1 B-Mode

5-2-4-6 3D-Mode (Freezes after 1 volume sweep)

see: 5-2-4-1 B-Mode

5-2-4-7 Real Time 4D-Mode (nonstop volume rendering)

see: 5-2-4-1 B-Mode

5-2-4-8 XBeam CRI-Mode (CrossBeam Compound Resolution Imaging)

see: 5-2-4-1 B-Mode

5-2-4-9 Extern-Video-Mode (display Video from Video-Recorder)

1.) CRS

Not used for Signal-Processing

2.) CPR

Not used for Signal-Processing

3.) CKV - DMA section

Not used for Signal-Processing

4.) CKV - Video section

Analog input from an external video source (YC or CVBS) is converted to a digital RGB data stream by a video decoder. It is mixed with the DVI video output from PC in an overlay unit (Chroma keying mechanism).
Generation of analog VGA signals for the monitor and standard video timing outputs follows this block.

5-2-4-10 Sonoview write mode (store Image to Sonoview)

1.) CRS
Not used

2.) CPR
Not used

3.) CKV - DMA section
Not used

4.) CKV - Video section
Not used

5-2-5 Description of Software Options

NOTICE Not all Options are available on the Voluson® 730Pro V (marked with * in the following sections of the Service Manual).

To activate the software options, see: Section 8-8 "Replacement or Activation of Options" on page 8-17.

Table 5-2 Software Options & Application Packages

individual SW-Options	Description	Fetal Echo Package*	Gyn Package*	Breast Package*
Real Time 4D	5-2-5-1 Real Time 4D	X	X	X
DICOM	5-2-5-2 DICOM			
RT_4D_Biopsy*	5-2-5-3 Real Time 4D-Biopsy *			X
VOCAL II*	5-2-5-4 VOCAL II* - Virtual Organ Computer-aided Analysis			
XTD-View	5-2-5-5 XTD-View (Extended View)			X
STIC*	5-2-5-6 STIC* (Spatio-Temporal Image Correlation)	X		
VCI*	5-2-5-7 VCI* - Volume Contrast Imaging			
SRI*	5-2-5-8 SRI* - Speckle Reduction Imaging			
SRI II*	5-2-5-9 SRI II*- Speckle Reduction Imaging	X	X	X
TUI*	5-2-5-10 T.U.I* - Tomographic Ultrasound Imaging		X	

NOTE: Additional options are not yet implemented.

BT Version: "VCI" is optional at BT05 Voluson® 730Pro systems. However, at BT08 systems (SW5.4.x installed), or systems that were upgraded to BT08 via upgrade kit, this feature is standard.

A software only update (no new BT-version key) does **NOT** activate this feature.
It remain optional and can be obtained via sales order.

BT Version: Application Packages are only available for Voluson® 730Pro systems with BT08 software (SW 5.4.x).

5-2-5-1 Real Time 4D

Real Time 4D mode is obtained through continuous volume acquisition and parallel calculation of 3D rendered images. In Real Time 4D mode the volume acquisition box is at the same time the render box. All information in the volume box is used for the render process. In Real Time 4D mode a “frame rate” of up 16 volumes/second (at Voluson® 730Pro V up to 10 volumes/second) is possible. By freezing the acquired volumes, size can be adjusted, manipulated manually as known from the Voluson 3D Mode.

5-2-5-2 DICOM

Voluson® 730Pro/ProV software package providing following DICOM functionality:

- Storage Service Class
- Print Management Service Class
- Modality Worklist Management Service Class
- Structured Reporting Service Class
- Storage Commit Service Class
- Modality Performed Procedure Step Service Class

Sending of reports - Additionally all OB/Gyn measurements can be sent to a PC*. Receiving of these reports is supported by ViewPoint workstation “PIA” only. All other workstations can be adapted individually.
* Without using structured reporting.

5-2-5-3 Real Time 4D-Biopsy *

For minimal invasive procedures like biopsies, ultrasound is a widely used method to visualize and guide the needle during puncture. The advantage in comparison with other imaging methods is the real-time display, quick availability and easy access to any desired region of the patient. The 4D biopsy allows for real time control of the biopsy needle in 3D multi-planar display during the puncture. The user is able to see the region of interest in three perpendicular planes (longitudinal, transversal and frontal section) and can guide the biopsy needle accurately into the centre of the lesion.

5-2-5-4 VOCAL II* - Virtual Organ Computer-aided Analysis

Diagnosis and therapy of cancer is one of the most important issues in medical care.
The VOCAL II - Imaging program allows completely new possibilities in cancer diagnosis, therapy planning and follow-up therapy control.

VOCAL II offers additional functions:

- Manual or Semi automatic Contour detection of structures (such as tumor lesion, cyst, prostate, etc.) and subsequent volume calculation.
  The accuracy of the process can be visually controlled by the examiner in multi-planar display.
- Construction of a virtual shell around the contour of the lesion. The wall thickness of the shell can be defined. The shell can be imagined as a layer of tissue around the lesion, where the tumor vascularization takes place.
- Automatic calculation of the vascularization within the shell by 3D color histogram by comparing the number of color voxels to the number of grayscale voxels.

5-2-5-5 XTD-View (Extended View)

XTD-View provides the ability to construct and view a static 2D image which is wider than the field of view of a given transducer. This feature allows viewing and measurement of anatomy that is larger than what would fit in a single image. XTD-View constructs the extended image from individual image frames as the operator slides the transducer along the surface of the skin in direction of the scan plane. Examples include scanning of vascular structures and connective tissues in the arms and legs.

NOTE: XTD is only working together with BT05 HW.

5-2-5-6 STIC* (Spatio-Temporal Image Correlation)

With this acquisition method the fetal heart or an artery can be visualized in 4D.
It is not a Real Time 4D technique, but a post processed 3D acquisition.

In order to archive a good result, try to adjust the size of the volume box and the sweep angle to be as small as possible. The longer the acquisition time, the better the spatial resolution will be.
A good STIC, STIC CFM (2D+CFM), or STIC PD (2D+PD) data set shows a regular and synchronous pumping of the fetal heart or of an artery.

The user must be sure that there is minimal movement of the participating persons (e.g., mother and fetus), and that the probe is held absolutely still throughout the acquisition period. Movement will cause a failure of the acquisition. The acquired images are post processed to calculate a 4D Volume Cine sequence. Please make sure that the borders of the fetal heart or the artery are smooth and there are no sudden discontinuities. If the user (trained operator) clearly recognizes a disturbance during the acquisition period, the acquisition has to be cancelled.

- STIC - Fetal Cardio is only available on RAB & RIC probes in the OB/GYN application.
- STIC - Vascular is only available on the RSP probe in the Peripheral Vascular application.

5-2-5-7 VCI* - Volume Contrast Imaging

Volume Contrast Imaging utilizes 4D transducers to automatically scan multiple adjacent slices and delivers a real-time display of the ROI. This image results from a special rendering mode consisting of texture and transparency information. VCI improves the contrast resolution and therefore facilitates finding of diffuse lesions in organs. VCI has more information (from multiple slices) and is of advantage in gaining contrast due to improved signal/noise ratio.

Static VCI is a part of the VCI option, which allow to apply the contrast enhancing VCI method to 3D data sets after the acquisition.

BT Version: "VCI" is optional at BT05 Voluson® 730Pro systems. However, at BT08 systems (SW5.4.x installed), or systems that were upgraded to BT08 via upgrade kit, this feature is standard.
A software only update (no new BT-version key) does **NOT** activate this feature. It remain optional and can be obtained via sales order.

5-2-5-8 SRI* - Speckle Reduction Imaging

Speckle Reduction Imaging (SRI) is a smoothing type filter to reduce speckle in the ultrasound image. It may be used when image speckle interferes with the desired image detail.

5-2-5-9 SRI II*- Speckle Reduction Imaging

A type of image noise or interference is generally considered undesirable and can obscure the quality or interpretation of B-mode images. Although somewhat associated with the underlying echogenicity of tissue scatters, image speckle characteristics such as brightness, density or size have no apparent value in determining tissue structure or related properties. The elimination of or significant reduction in speckle improves the quality or diagnostic potential of the image.
The method applied in the subject modification utilizes a nonlinear diffusion filtering technique that permits effective speckle reduction in real time. The speckle reduction filter is available to the user in all B-mode imaging, independent of the transducer used.

NOTICE Software 5.0.3 or higher is required.

5-2-5-10 T.U.I* - Tomographic Ultrasound Imaging

TUI is a new visualisation mode for 3D and 4D data sets. The data is presented as slices through the data set which are parallel to each other. An overview image, which is orthogonal to the parallel slices, shows which parts of the volume are displayed in the parallel planes. This method of visualisation is consistent with the way other medical systems such as CT or MRI, present the data to the user.
The distance between the different planes can be adjusted to the requirements of the given data set. In addition it is possible to set the number of planes. The planes and the overview image can also be printed to a DICOM printer, for easier comparison of the ultrasound data with CT and/or MRI data.

5-2-6 Description of Hardware Options

Table 5-3 Hardware Options

	HW-Options	Description
1	CW-Doppler	5-2-6-1 CW - Continuous Wave Doppler
2	ECG Digital Module	5-2-6-2 ECG Preamplifier
3	MOD (Magneto-Optical Drive)	5-2-6-3 MOD (Magneto-Optical Drive)
4	Scan/Freeze Foot switch	5-2-6-4 Scan/Freeze Footswitch
5	Global Modem	5-2-6-5 Global Modem

5-2-6-1 CW - Continuous Wave Doppler

CW Doppler mode provides real time spectral analysis of CW Doppler signals. This information describes the Doppler shifted signal from the moving reflectors in the CW Doppler beam.
CW Doppler can be referenced through a small pencil probe or phased array scan head, but it can also be used in conjunction with a 2D image which has an M-line superimposed on the 2D image indicating the position of the Doppler sample volume. For through-the-beamformer CW, this beam is steerable by the operator, and is done by adjusting the location of the M-line. The CW Doppler beam, or M-mode line, can be steered allowing interrogation along an operator-selected line within the image.
This option can be upgraded by implementing the CW-Dopplerboard (CRW).

5-2-6-2 ECG Preamplifier

MAN6 (internal, digital version)

For details see: Section 5-10-2 "ECG-preamplifier (MAN6 - optional)" on page 5-48.

5-2-6-3 MOD (Magneto-Optical Drive)

For details see: Section 5-10-4 "Magneto-Optical Drive (optional)" on page 5-48.

5-2-6-4 Scan/Freeze Footswitch

Footswitch connected to Power Supply-Box (below Main Electronic-Box)

Figure 5-7 Footswitch Connector on CPN

5-2-6-5 Global Modem

The Multi-Tech global modem is a standard modem that connects to an analog phone line.
It provides high-speed data transfers and fax capabilities. Features like remote configuration, callback security, and 2-wire leased line support set it apart from basic desktop modems.
In addition, it is approved for use in many countries around the world.

5-2-6-5-1 Location in the Unit

Figure 5-8 Modem (placed on the GEZ-box)

5-2-6-5-2 LEDs

The Modem has 10 LEDs on its front.

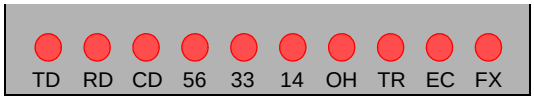


Figure 5-9 LEDs on Modem's Front Panel

Table 5-4 LEDs on Modem

LED Color	Description	Normally State
- Red	TD (Transmit Data)	Flashes during use.
- Red	RD (Receive Data)	Flashes during use.
- Red	CD (Carrier Detect)	ON when detecting a carrier from another modem and during communication. OFF indicates no or broken connection.
- Red	56 (56K Mode)	During Power On: Briefly Flashing These LEDs indicates communication speeds above 14 kbs. If one of this LEDs are ON during communication, it will stay ON until the modem is reset or connected the next time. At speeds below 14 kbs, these LEDs are OFF.
- Red	33 (V.34 Mode)	
- Red	14 (V.32bis Mode)	
- Red	OH (Off hook)	ON when dialing, online, or answering a call Flashes if puls dialing Off when modem not in use
- Red	TR (Terminal Ready)	ON when the system initializes the modem. It indicates that the modem is ready for an outgoing or incoming call. OFF indicates that communication on the RS232 (COM) port has been broken. The connected (remote) modem will disconnect.
- Red	EC (Error Correction (V.42))	ON: Error Correction (V42) is turned ON Blinking: Compression turned ON OFF: Normal operation.
- Red	FX (Fax)	Always OFF

Section 5-3
Main board Chassis - GEZ Module

The GEZ Module contains the Front End processor and the Back End processor and the Secondary Power supply for the full GEZ Chassis.
Additionally GEZ Module is the connection point of the internal I/O wiring.

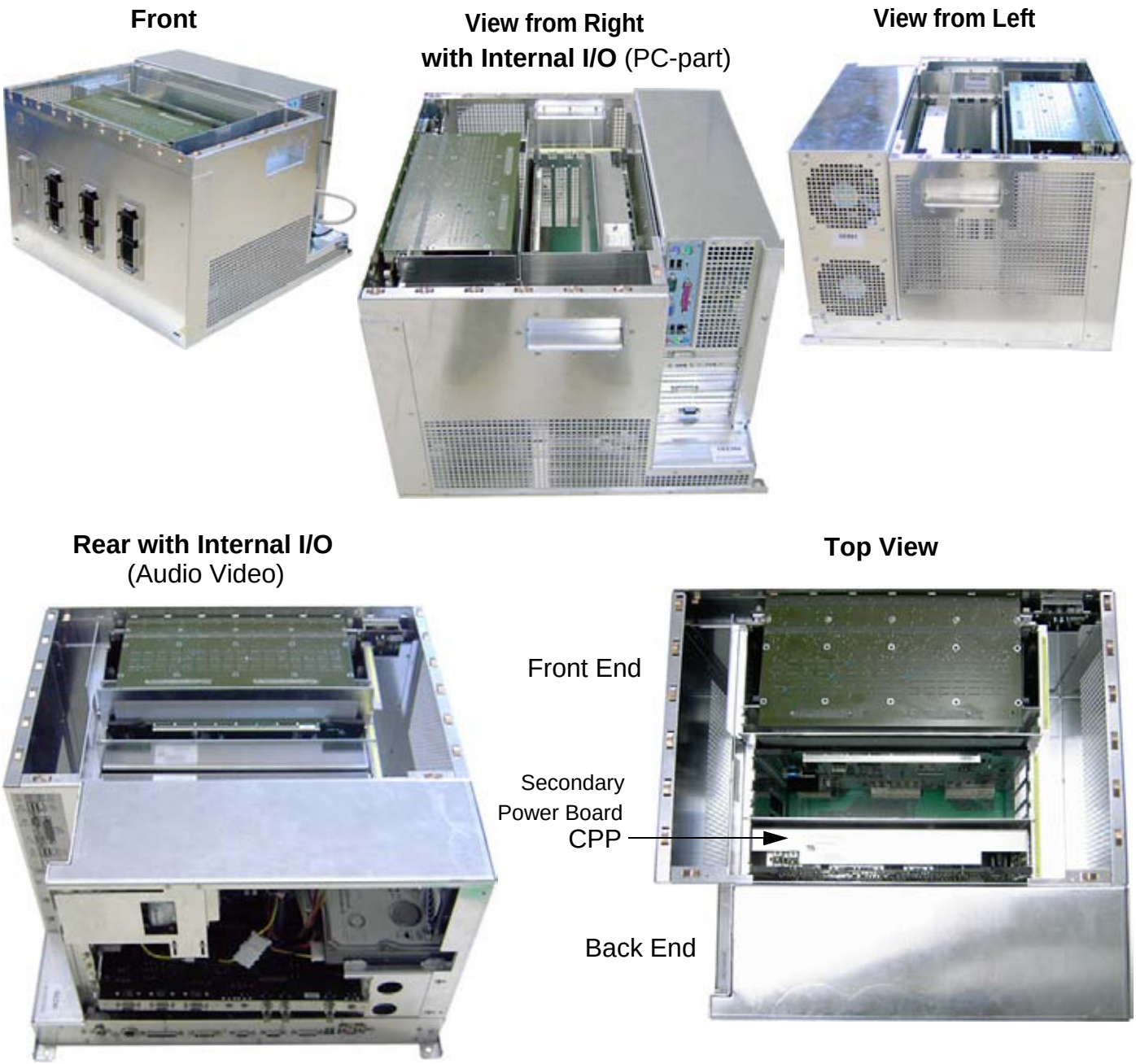


Figure 5-10 Mechanic of GEZ Module

Section 5-4
FrontEnd Processor

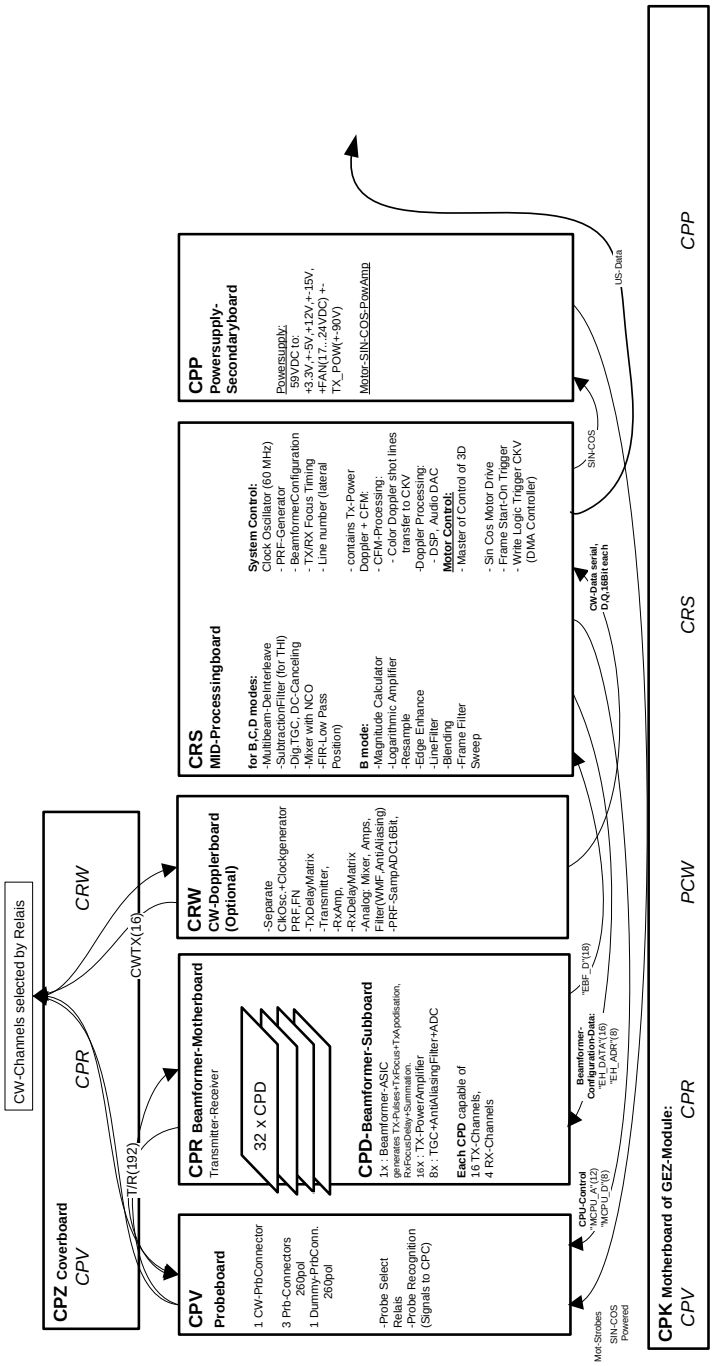


Figure 5-11 Front End Processor - Block diagram

5-4-1 FrontEnd - Board Descriptions

5-4-1-1 CPV - Probe Connector Board

- 1 CW-Probe Connector
- 3 Probe-Connectors 260pin
- 1 Dummy-Probe Connector 260pin
- Probe Select Relays
- Probe Recognition

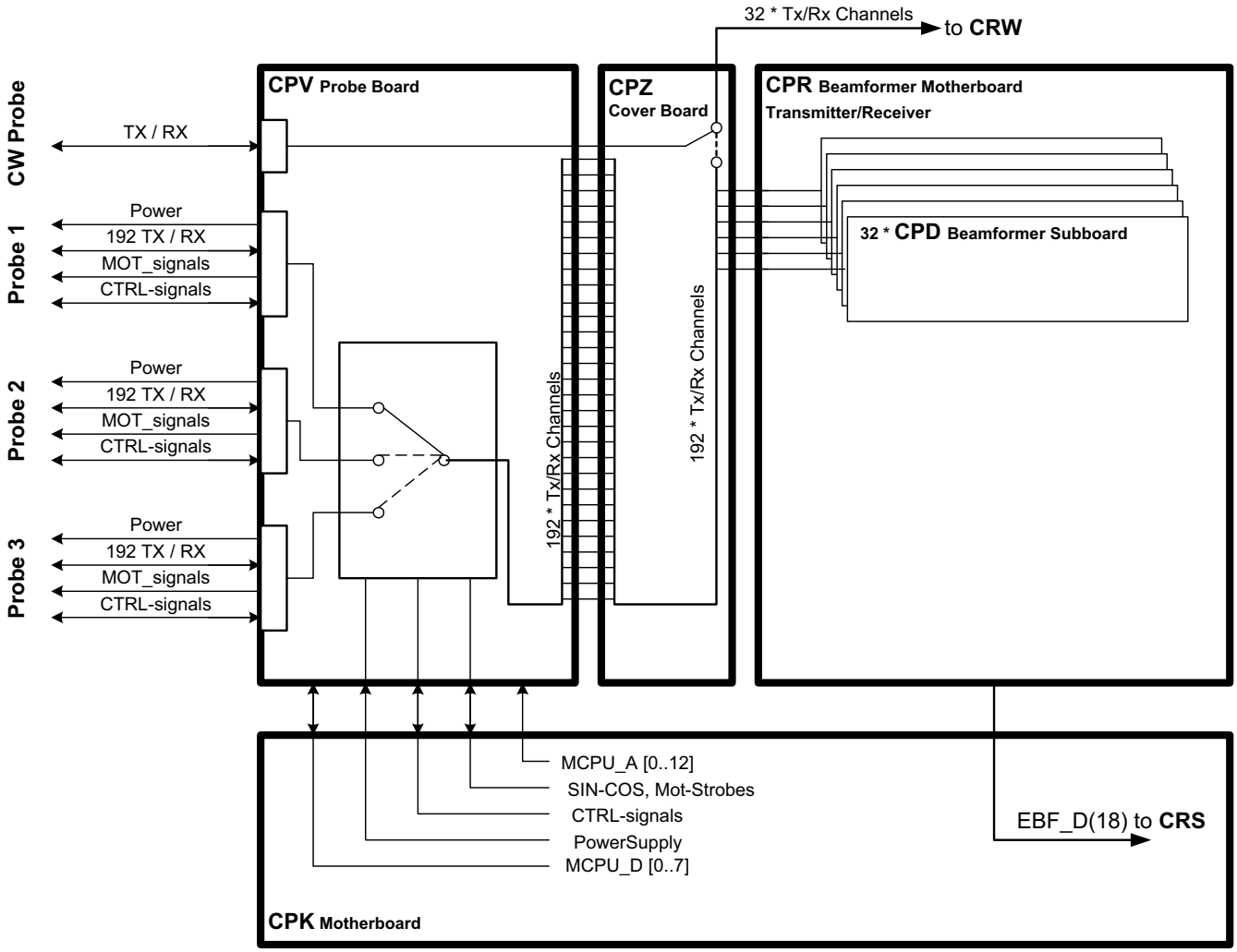


Figure 5-12 CPV + Beamformer (CPR)

5-4-1-2 CPR - Beamformer-Motherboard

Transmitter-Receiver (192 transmitter channel used, 128 Receiver channels)

CPR contains 32 pieces of CPD (see: Section 5-4-1-3 "CPD - Beamformer Sub-board" on page 5-24)

5-4-1-3 CPD - Beamformer Sub-board

1x : Beamformer-ASIC
generates TX-Pulses + TX-Focus +TX-Apodization, Rx Focus Delay and Summation

16x : TX-Power Amplifier

4x : TGC + Anti Aliasing Filter + Analogue Digital Conversion (ADC)

Each CPD is capable of 16 TX-Channels and 4 RX-Channels

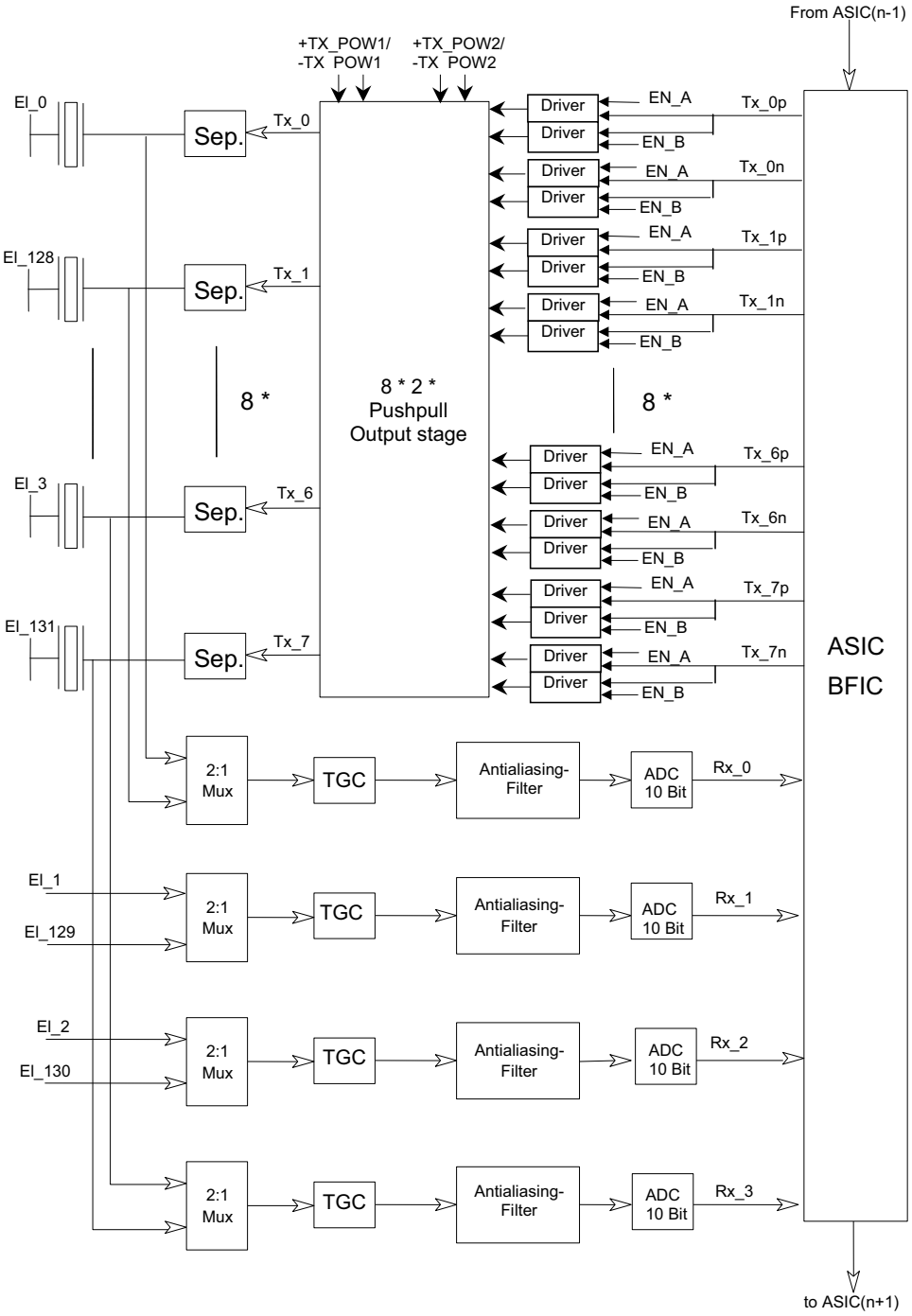


Figure 5-13 Block diagram CPD

5-4-1-4 CRW - CW-Doppler Board (optional)

- Separate Clock Oscillator + Clock generator PRF, FN
- TxDelayMatrix
- Transmitter,
- Receiver Amplifiers (RxAmp),
- Receiver Delay matrix (RxDelayMatrix)
- Analogue: Mixer, Amplifier, Filter (WMF, Anti Aliasing)
- PRF-SampADC16Bit,

5-4-1-5 CPZ - Cover Board

Transfers the analogue transmitting / receiving signals between the following boards:

- CPV
- CPR
- CRW

192 Transmitter-, 128 Receiver channels, 16 CW-Doppler channels - switched by relays at CPZ

5-4-1-6 CPK - Motherboard of GEZ-Module

Following boards are direct connected to the CPK:

- CPV - Probe connector Board
- CPR - Beam former Board
- CRW - CW-Doppler Board
- CRS - Signal Processing Board
- CPP - Power Supply Board

5-4-1-7 CRS - Signal Processor Board

A.) MID-Processor:

1.) For B, C, D modes:

- Multi Beam-DeInterleave
- Subtraction Filter (for HI)
- Digital TGC, DC-Cancelling
- Mixer with NCO
- FIR-Low Pass

2.) For B mode only:

- Magnitude Calculator
- Logarithmic Amplifier
- Resample
- Edge Enhance
- Line Filter
- Blending
- Frame Filter

B.) System Control:

- Clock Oscillator (60MHz)
- PRF (Pulse Repetition Frequency) Generator
- Beamformer Configuration:
- Tx (transmitting Frequency, TxRx (transmitting/receiving) Focus timing
- TxRx (transmitting/receiving) Apodization
- Line number (lateral Position)
- contains TX-Power-DAC

C.) Doppler + CFM:

1.) CFM-processing:

- Color-Doppler shot lines transfer to CKV

2.) Doppler-Processing:

- DSP, Audio DAC

3.) Beamformer- Configuration-Data:

- "EH_DATA"(16)
- "EH_ADR"(8)
- B-Mode-Data

D.) Motor Control:

- Master of Control of 3D-Sweep
- Drives Motor via SIN-COS
- Triggers Frame-start on CPR (Beamformer)
- Triggers Write-Logic on CKV (DMA-Controller)

5-4-1-8 CPP - Power Supply Secondary Board + Motor Power stage

used for Supply of both FrontEnd and BackEnd DC-DC-Converter:

59VDC to following output voltages:

+ 3.3V, +/-5V, +12V, +/-15V,

+ FAN (10 -24V / 15 Watt; adjustable by software)

- +TX_POW (+/-90V)
- -TX_POW (+/-90V)
- +TX_POW2
- -TX_POW2

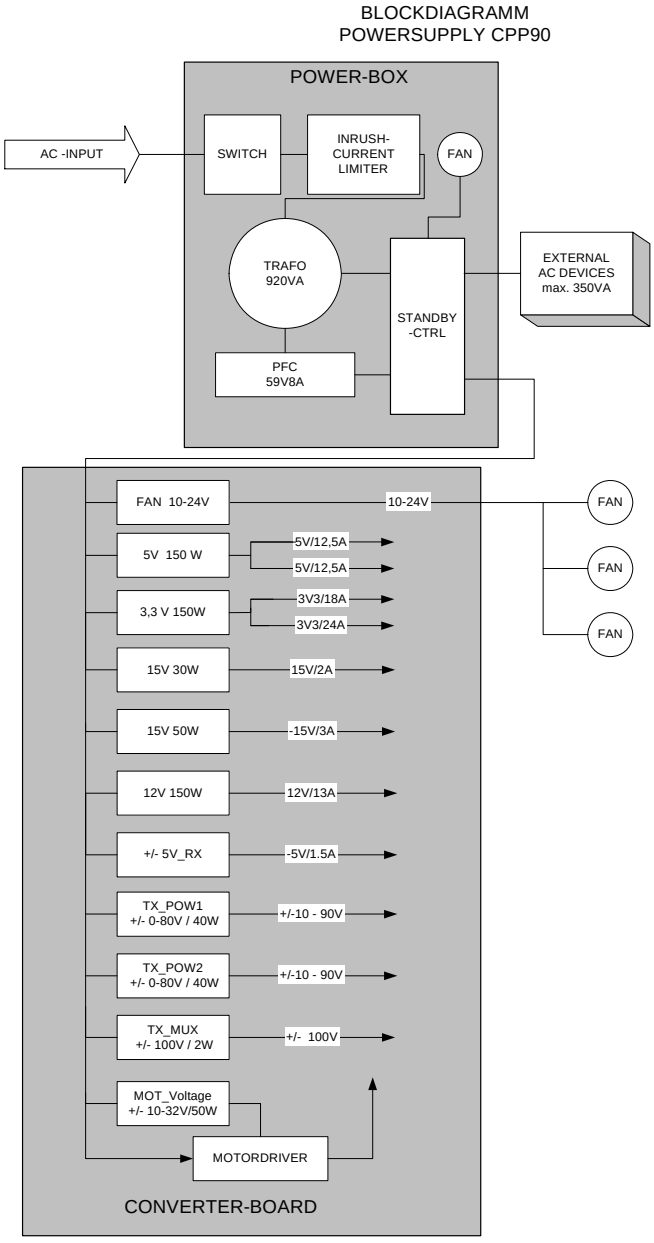


Figure 5-14 Block diagram CPP

Section 5-5
BackEnd Processor

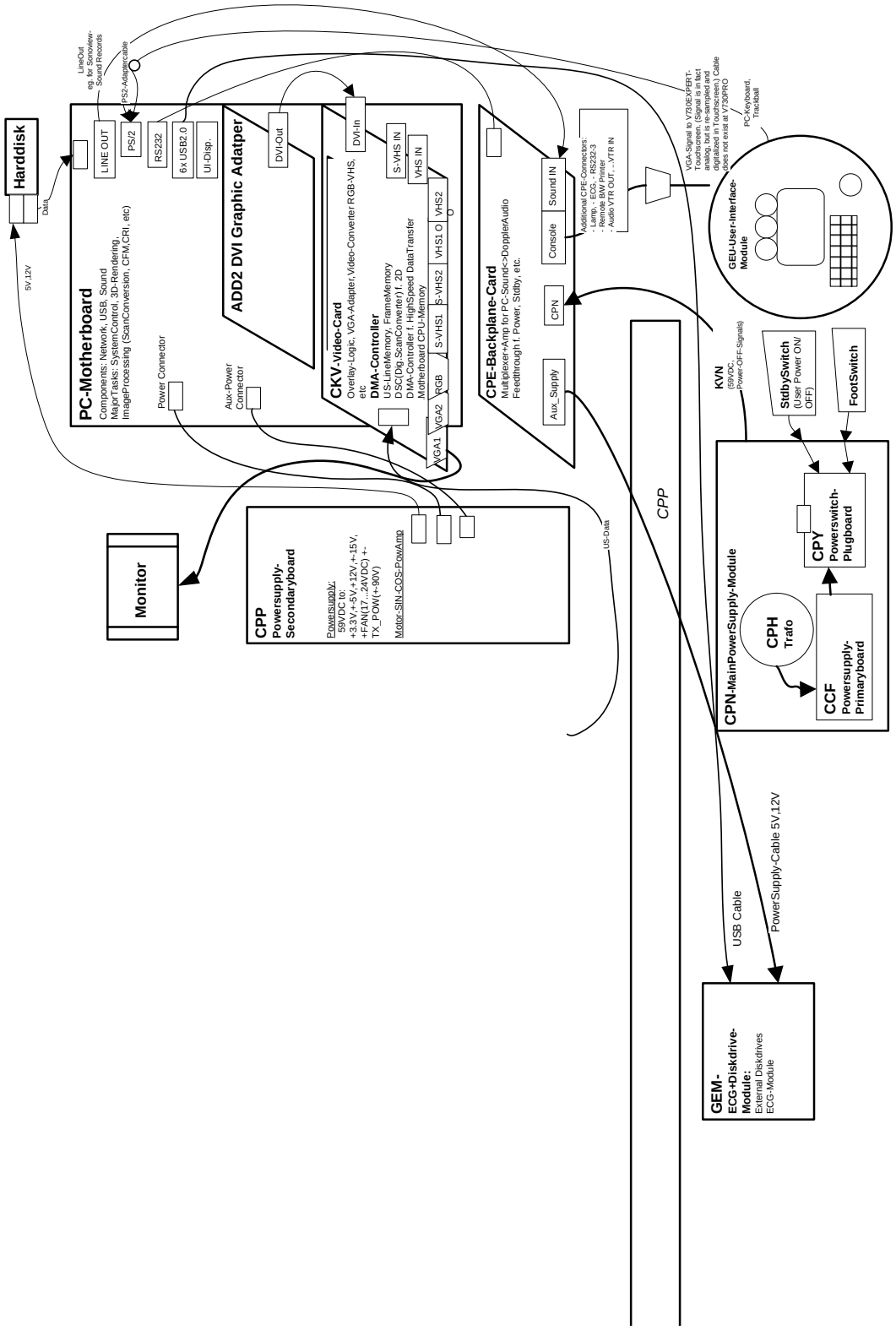
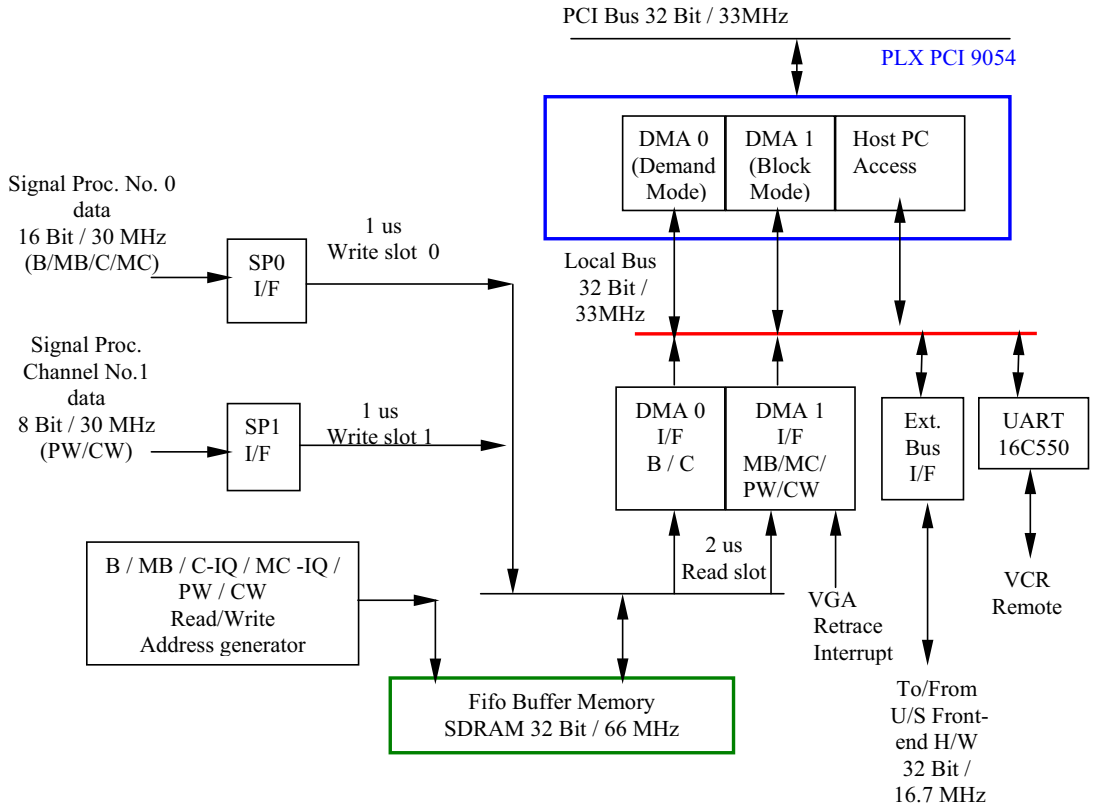


Figure 5-15 BackEnd Processor - Block diagram

5-5-1 Block diagram CKV

DMA Controller


PCI Bus 32 Bit / 33MHz
PLX PCI 9054
DMA 0 (Demand Mode)
DMA 1 (Block Mode)
Host PC Access
Signal Proc. No. 0 data 16 Bit / 30 MHz (B/MB/C/MC)
SP0 I/F
1 us Write slot 0
Local Bus 32 Bit / 33MHz
Signal Proc. Channel No.1 data 8 Bit / 30 MHz (PW/CW)
SP1 I/F
1 us Write slot 1
DMA 0 I/F B / C
DMA 1 I/F MB/MC/ PW/CW
Ext. Bus I/F
UART 16C550
2 us Read slot
VCR Remote
B / MB / C-IQ / MC -IQ / PW / CW Read/Write Address generator
VGA Retrace Interrupt
Fifo Buffer Memory SDRAM 32 Bit / 66 MHz
To/From U/S Front-end H/W 32 Bit / 16.7 MHz

Video I/O

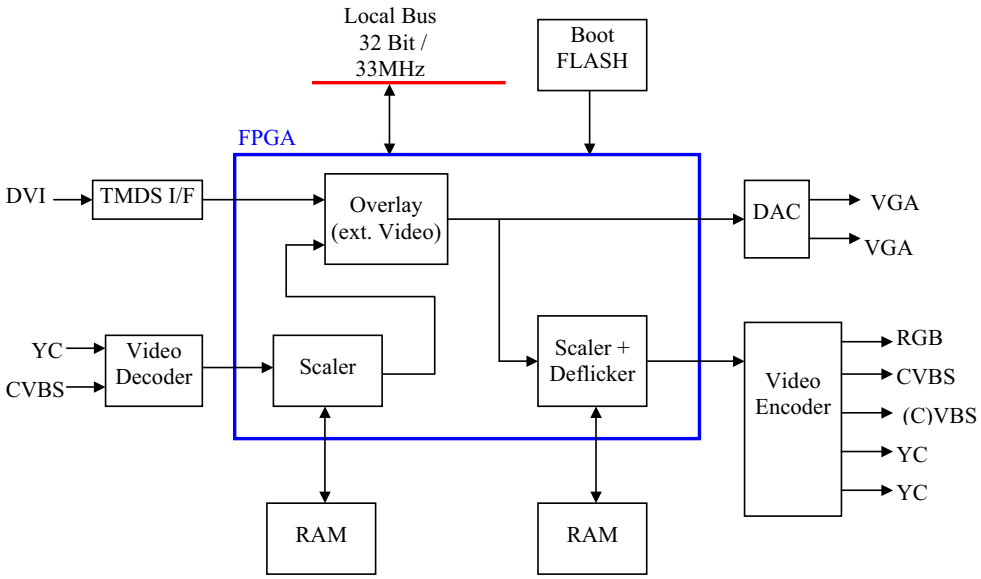


Figure 5-16 Block diagram CKV

5-5-2 BackEnd - Board Descriptions

5-5-2-1 SBC - Single Board Computer

Built in or external Components:

- On Board VGA
- 1 Gbit LAN
- USB 2.0
- Sound

Major Tasks:

- System Control
- 2D / 3D-Image processing and Rendering
- RS232 (User Interface)
- PS2 (User Interface PC-Keyboard, Mouse as Trackball)
- Control GEM drives (USB)

5-5-2-2 ADD2-DVI (Add-On) Graphic Adapter Card

DVI graphic extension card which supplies CKV (Video manager) board with DVI Video

5-5-2-3 CKV - DMA-Controller / Video-Card

- DMA-Controller f. High Speed Data Transfer into Slot-CPU-Memory
- VGA- Output (2 Channels) for the System Main Monitor and external device
- Video-Converter VGA RGB to: VHS, S-VHS, RGB
- Display External Playback Video and adding Overlay graphics to it.

see also: Figure 5-16: Block diagram CKV on page 5-29

5-5-2-4 Hard Disk Drive

Minimum 80GB; IDE

Stores the system programs and Image filing (patient data, Report files)

5-5-2-5 CPE - Back Panel I/O-Card

Multiplexer +Amplifier for PC-Sound<>Doppler Audio

Feed through for DC- Power and signals and for built in Peripherals (User Interface, Disk drive module, ECG, etc.)

5-5-2-6 CPP - Power Supply Secondary Board + Motor Power stage

used for Supply of both FrontEnd and BackEnd

DC-DC-Converter:

59VDC to following output voltages:

+ 3.3V, +/-5V, +12V, +/-15V,

+ FAN (10 -24V / 15 Watt; adjustable by software)

- +TX_POW (+/-90V)
- -TX_POW (+/-90V)
- Motor Sinus2 Powerstage Amplifier
- Motor Cosinus2 Powerstage Amplifier
- +TX_POW2
- -TX_POW2

see also: Section 5-4-1-8 on page 5-27

Section 5-6
Internal I/O

Internal I/O depends on the SBC-board installed.

- *If "**Kontron ATX**" SBC-board is installed, see:* Section 5-6-1 on page 5-33.
- *If "**Tyan**" SBC-board is installed, see:* Section 5-6-2 on page 5-35.
- *If "**Kontron Flex**" SBC-board is installed*, see: Section 5-6-3 on page 5-37.
- *If " **DFI ATX**" SBC-board is installed*, see: Section 5-6-4 on page 5-39.

However, connectors on the Main Module of the GEZ-box are the same (independent of installed SBC).

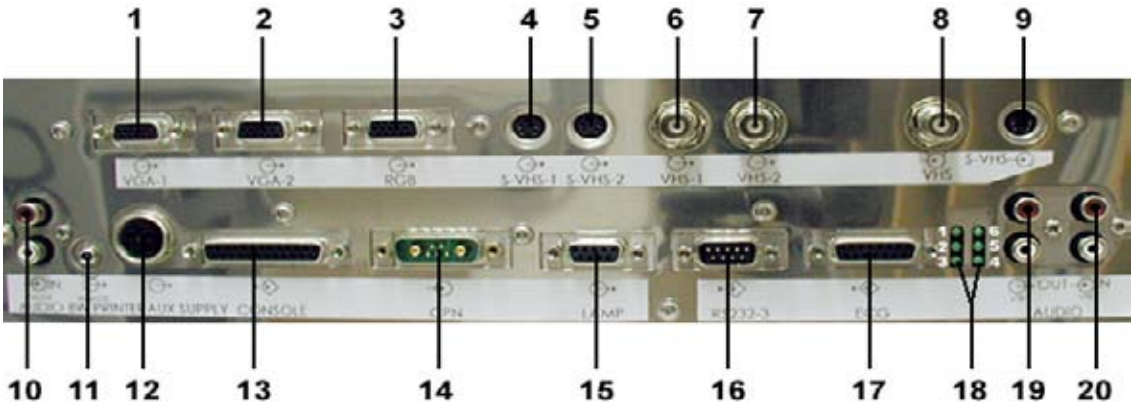
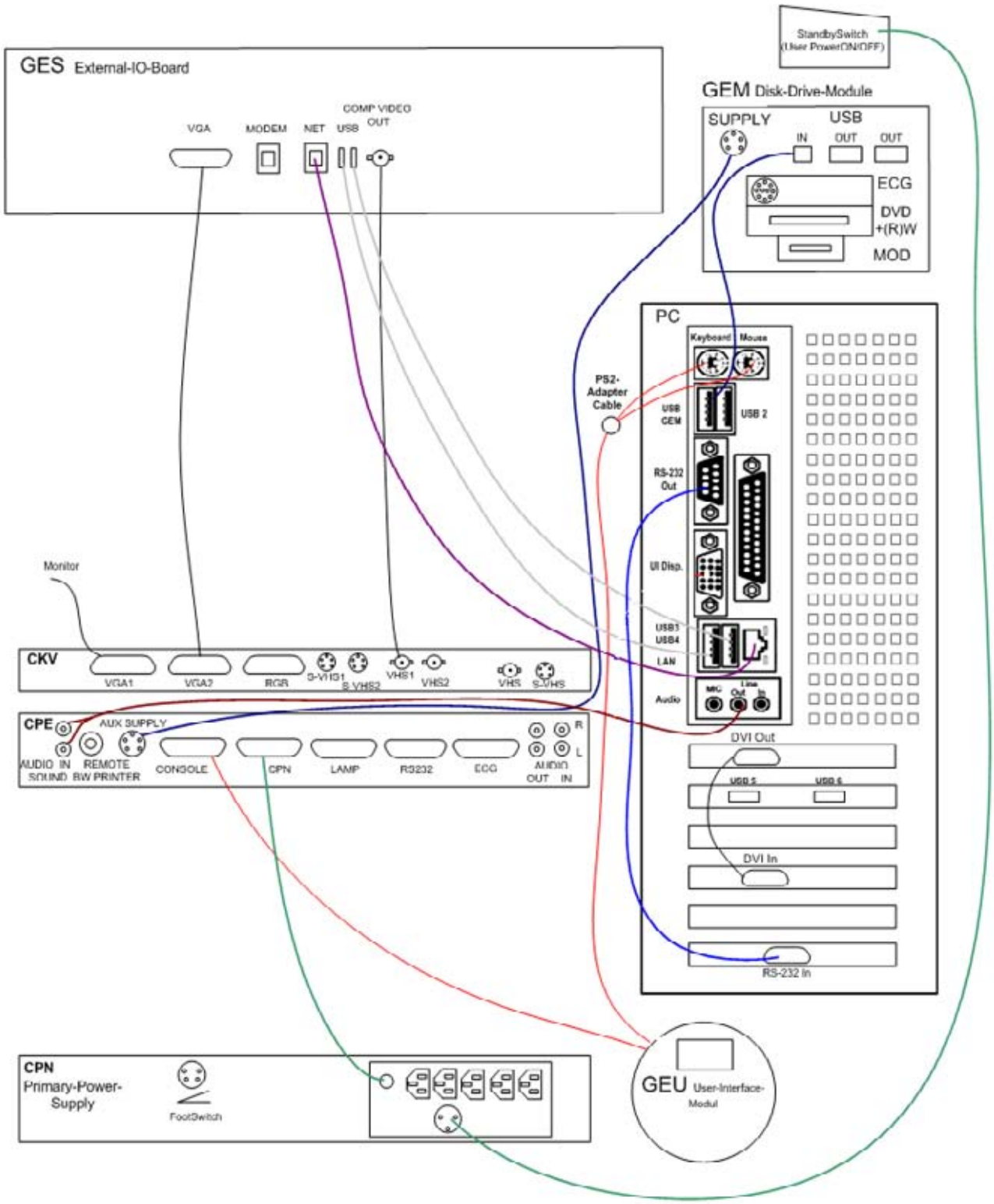


Figure 5-17 Connectors on the Main Module of the GEZ

Item	Connector Name	Description
1	VGA1	Connector for the internal color video monitor
2	VGA2	Connector for an external color monitor
3	RGB	Output for color video printer
4	S-VHS 1	S-VHS 1 OUT
5	S-VHS 2	S-VHS 2 OUT
6	VHS 1	Video 1 OUT: 1Vss @ 75 Ohm, PAL ; 1Vss @ 75 Ohm, NTSC
7	VHS 2	Video 2 OUT: 1Vss @ 75 Ohm, CCIR ; 1Vss @ 75 Ohm, FCC
8	VHS	Video IN: 1Vss @ 75 Ohm, PAL / CCIR ; 1Vss @ 75 Ohm, NTSC / FCC
9	S-VHS	S-VHS IN
10	Audio IN Sound	Audio IN R/L Sound
11	Remote BW Printer	Remote control for BW Printer
12	AUX Supply	Power Supply for Module GEM
13	Console	Connector for Console
14	CPN	Connector for Power Supply (CPN) input
15	Lamp	Connector for external lamp
16	RS232-3	Remote control for Video or DVD Recorder
17	ECG	Connector for MAN (ECG-preamplifier)
18	----------	Diagnostic LED´s (for voltage check; see: Section 7-3-1 on page 7-3) 1 = +15V ; 2 = -15V ; 3 = Fan ; 4 = +12V ; 5 = +5V ; 6 = +3.3V
19	Audio OUT / VTR	Audio OUT / R/L Video Recorder
20	Audio IN / VTR	Audio IN / R/L Video Recorder

5-6-1 Internal I/O - if “Kontron ATX” SBC-board is installed



* Cable is only used in combination with “Kontron” SBC-board version.
Other versions have internal connector cable, directly connected from CPE flat cable connector (S5) to SBC COM1 (J22) connector.

Figure 5-18 Internal I/O (“Kontron ATX” SBC-board installed)

5-6-1 Internal I/O - if "Kontron ATX" SBC-board is installed (cont'd)

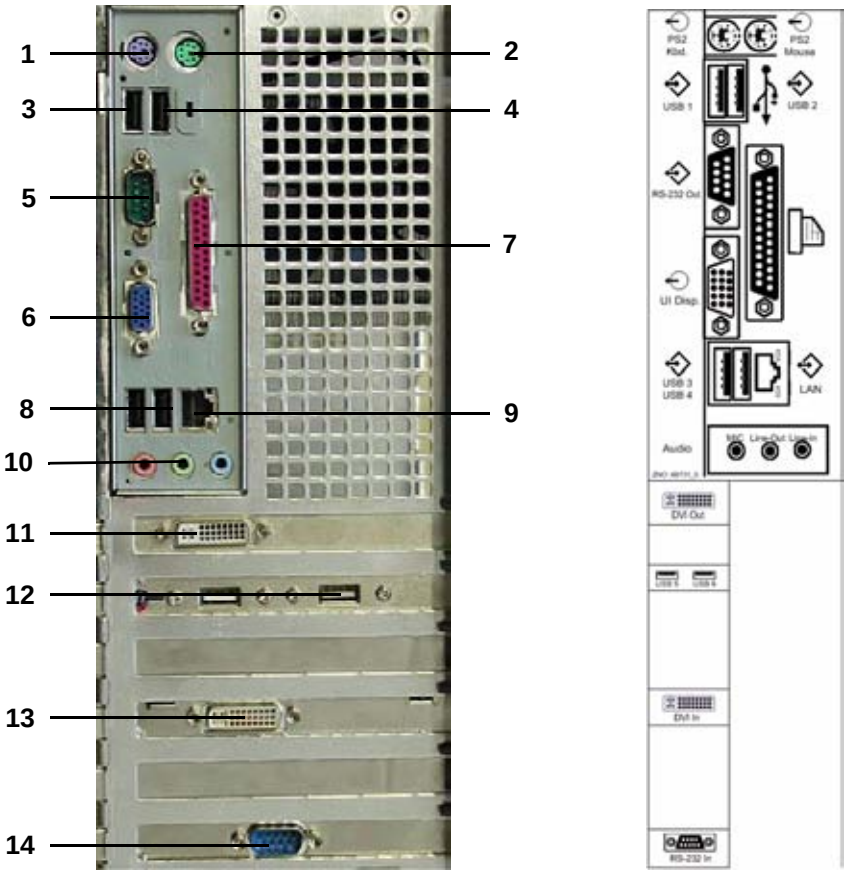


Figure 5-19 Connectors on PC-part of the GEZ ("Kontron ATX" SBC-board installed)

Item	Connector Name	Description
1	PS2 Kbd.	Connector for Keyboard
2	PS2 Mouse	Connector for Mouse
3	USB GEM	Connector for Disk Drive Module GEM
4	USB 2	USB port connector
5	RS-232 Out	Electrical-Signal-Connection between CPS and PIC_MG_Slot-CPU
6	UI Disp.	Connector for User Interface Display NOT used at: Voluson® 730Pro/ProV
7	Parallel Port	Parallel Port for PC-Line Printer
8	USB 3 and USB 4	USB port connectors
9	LAN	Connector for Network twisted pair RJ-45 10/100 megabits/s
10	Audio	MIC = Connector for Microphone Line-Out = Connector for Sound card (green connector)
11	DVI Out	Digital Visual Interface (TMDS cable) / Out
12	USB 5 and USB 6	USB port connectors
13	DVI In	Digital Visual Interface (TMDS cable) / In
14	RS-232 In	Electrical-Signal-Connection between CKV and PC-Board (SBC)

5-6-2 Internal I/O - if “Tyan” SBC-board is installed

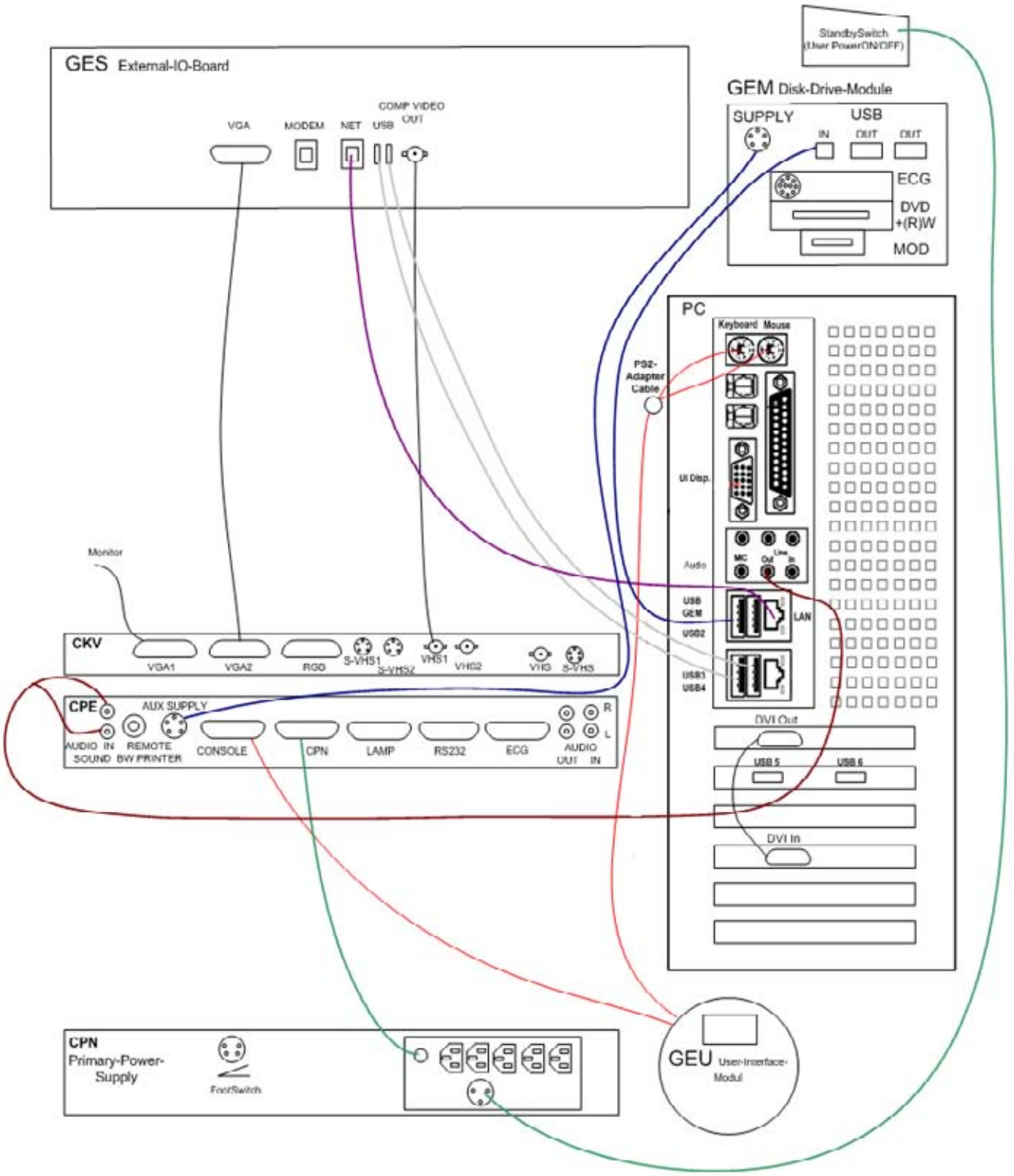


Figure 5-20 Internal I/O (“Tyan” SBC-board installed)

5-6-2 Internal I/O - if "Tyan" SBC-board is installed (cont'd)

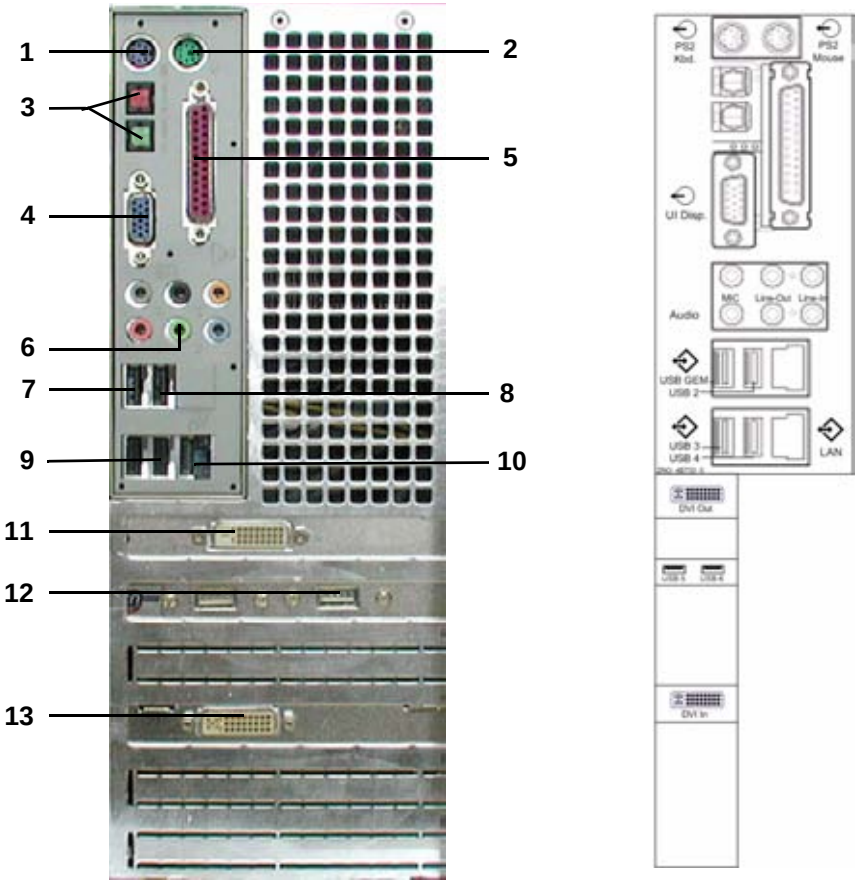


Figure 5-21 Connectors on PC-part of the GEZ ("Tyan" SBC-board installed)

Item	Connector Name	Description
1	PS2 Kbd.	Connector for Keyboard
2	PS2 Mouse	Connector for Mouse
3	*******	********** not used
4	UI Disp.	Connector for User Interface Display NOT used at: Voluson® 730Pro/ProV
5	Parallel Port	Parallel Port for PC-Line Printer
6	Audio	MIC = Connector for Microphone Line-Out = Connector for Sound card (green connector)
7	USB GEM	Connector for Disk Drive Module GEM
8	USB 2	USB port connector
9	USB 3 and USB 4	USB port connectors
10	LAN	Connector for Network twisted pair RJ-45 10/100 megabits/s
11	DVI Out	Digital Visual Interface (TMDS cable) / Out
12	USB 5 and USB 6	USB port connectors
13	DVI In	Digital Visual Interface (TMDS cable) / In

5-6-3 Internal I/O - if “Kontron Flex” SBC-board is installed

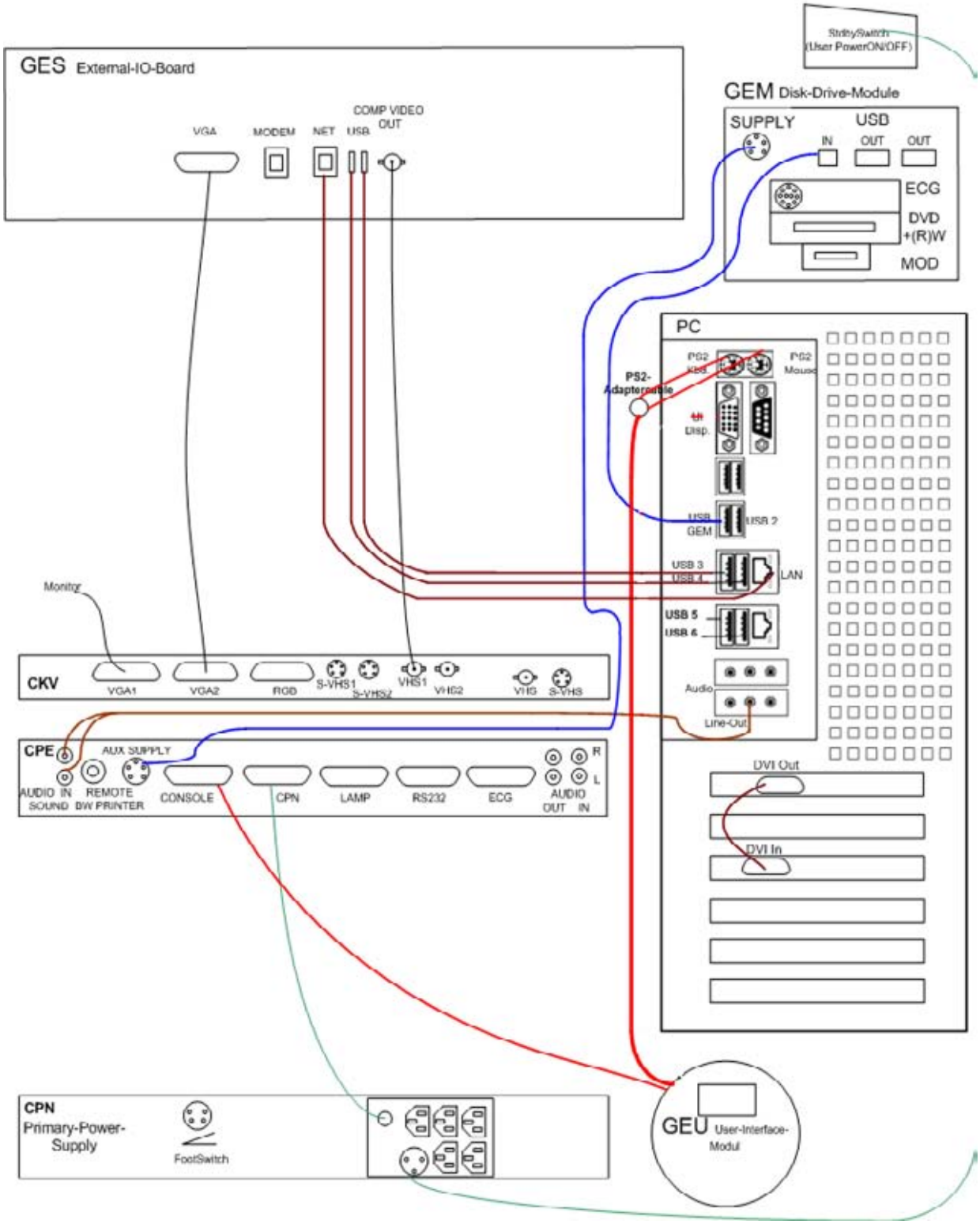


Figure 5-22 Internal I/O (“Kontron Flex” SBC-board installed)

5-6-3 Internal I/O - if "Kontron Flex" SBC-board is installed (cont'd)

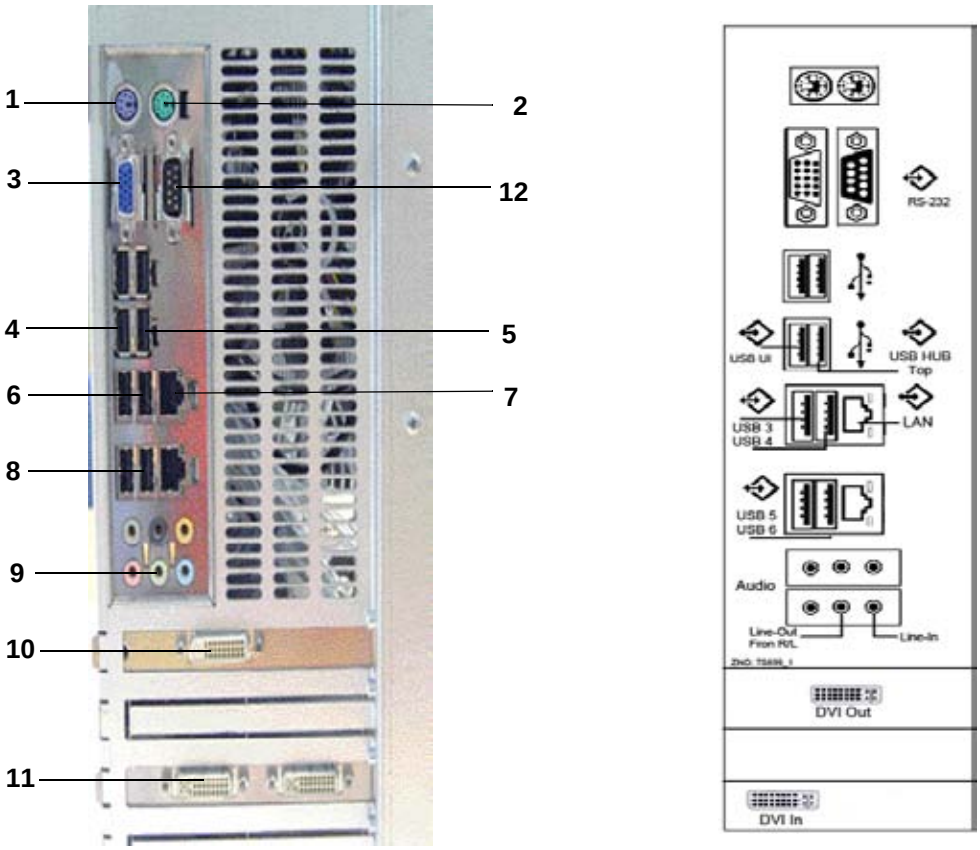


Figure 5-23 Connectors on PC-part of the GEZ ("Kontron Flex" SBC-board is installed)

Item	Connector Name	Description
1	PS2 Kbd.	Connector for Keyboard
2	PS2 Mouse	Connector for Mouse
3	UI Disp.	Connector for User Interface Display NOT used at: Voluson® 730Pro/ProV
4	USB GEM	Connector for Disk Drive Module GEM
5	USB 2	USB port connector
6	USB 3 and USB 4	USB port connectors
7	LAN	Connector for Network twisted pair RJ-45 10/100 megabits/s
8	USB 5 and USB 6	USB port connectors
9	Audio	MIC = Connector for Microphone Line-Out = Connector for Sound card (green connector)
10	DVI Out	Digital Visual Interface (TMDS cable) / Out
11	DVI In	Digital Visual Interface (TMDS cable) / In
12	*******	**********not used

5-6-4 Internal I/O - if “DFI ATX” SBC-board is installed

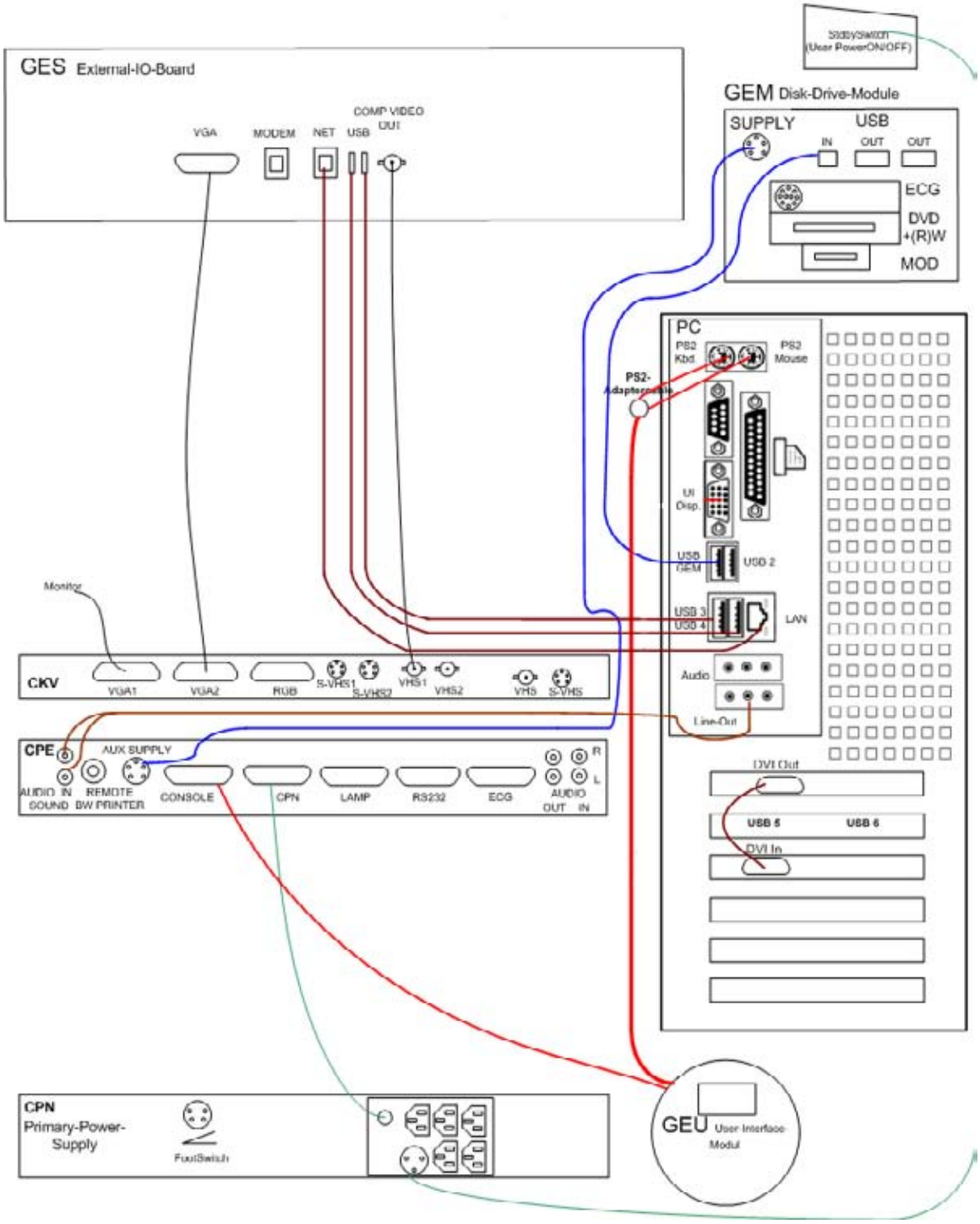


Figure 5-24 Internal I/O (“DFI ATX” SBC-board installed)

5-6-4 Internal I/O - if "DFI ATX" SBC-board is installed (cont'd)

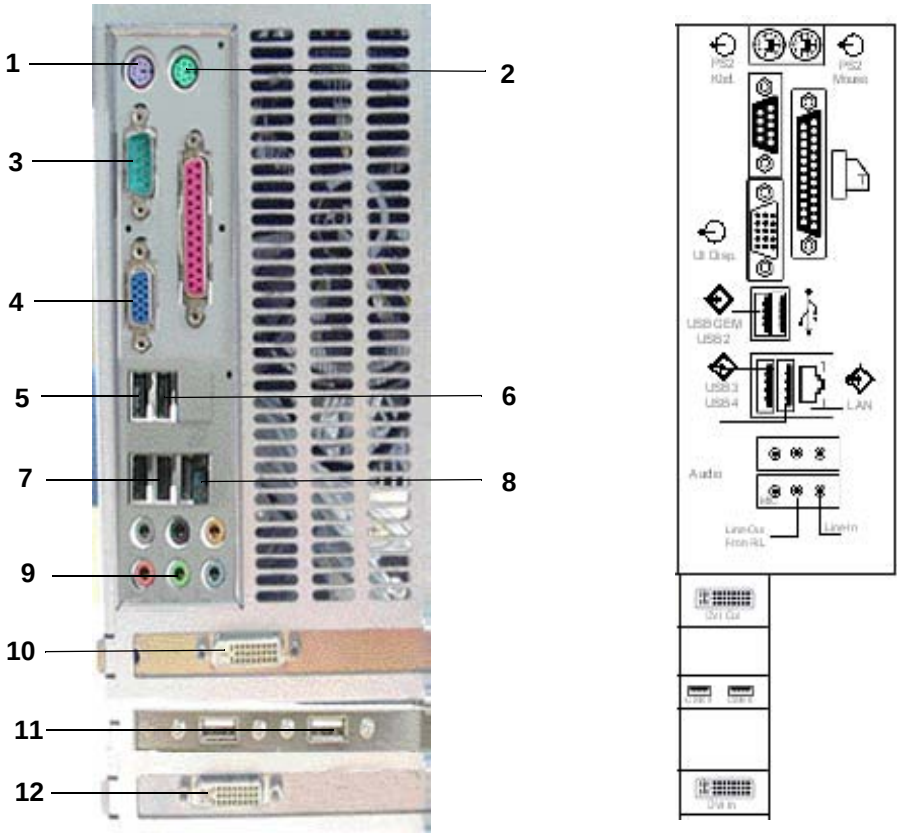


Figure 5-25 Connectors on PC-part of the GEZ ("DFI ATX" SBC-board is installed)

Item	Connector Name	Description
1	PS2 Kbd.	Connector for Keyboard
2	PS2 Mouse	Connector for Mouse
3	*******	********** not used
4	UI Disp.	Connector for User Interface Display NOT used at: Voluson® 730Pro/ProV
5	USB GEM	Connector for Disk Drive Module GEM
6	USB 2	USB port connector
7	USB 3 and USB 4	USB port connectors
8	LAN	Connector for Network twisted pair RJ-45 10/100 megabits/s
9	Audio	MIC = Connector for Microphone Line-Out = Connector for Sound card (green connector)
10	DVI Out	Digital Visual Interface (TMDS cable) / Out
11	USB 5 and USB 6	USB port connectors
12	DVI In	Digital Visual Interface (TMDS cable) / In

Section 5-7
Top Console

The Voluson® 730Pro/ProV Operator Control Panel (OCP) consists of the following electronic subassemblies and/or functional components:

- Console module:
  - C515 micro controller
  - Atmel micro controller
  - Slide pots TGC with zero raster position)
  - Rotary Encoders with integrated push buttons
  - PS/2 compatible Trackball (2”) with standard PC interface
  - PS/2 compatible Qwerty Keyboard with standard PC interface
  - LED indicators with 3 intensity levels (off, 50%,100%)
  - 2 Speaker, used for Doppler and voice replay
- DC/DC Converter:
  - Converts 12V DC input voltage to 5V DC output voltage for supplying UI components

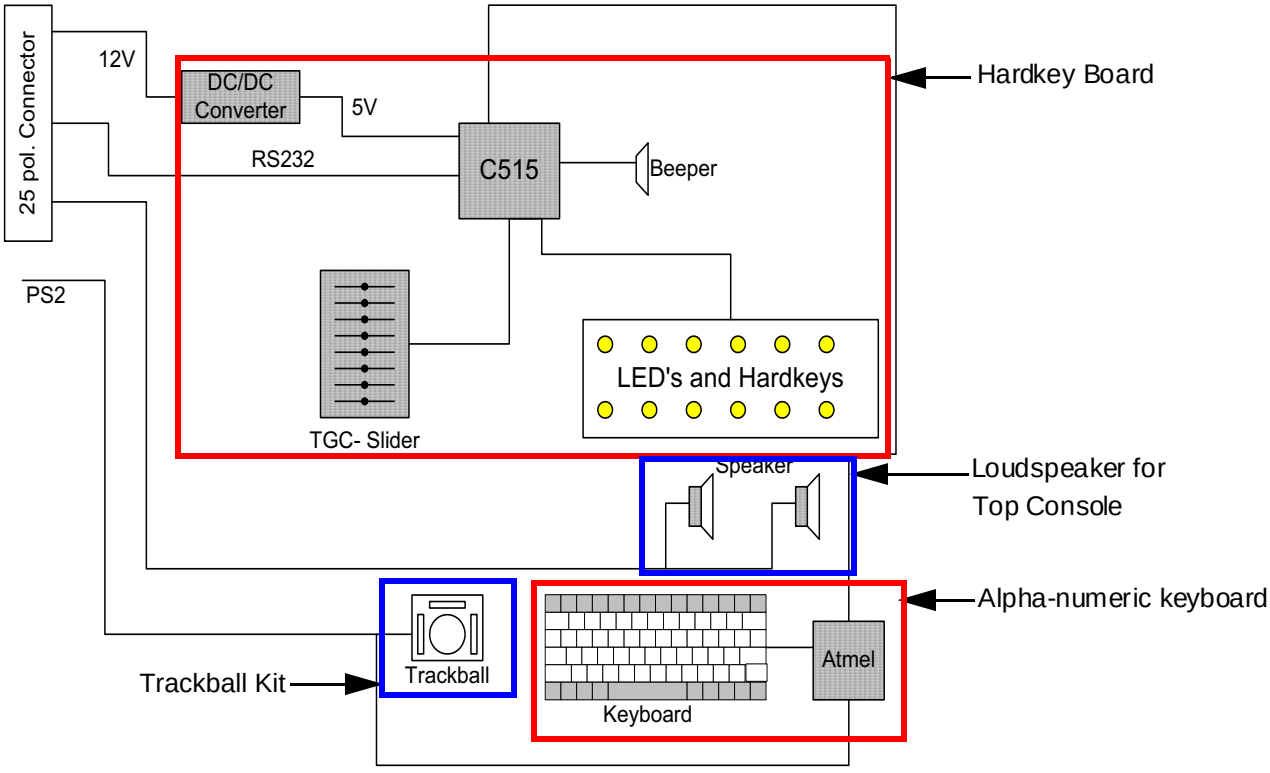


Figure 5-26 Top Console

Section 5-7 Top Console (cont'd)

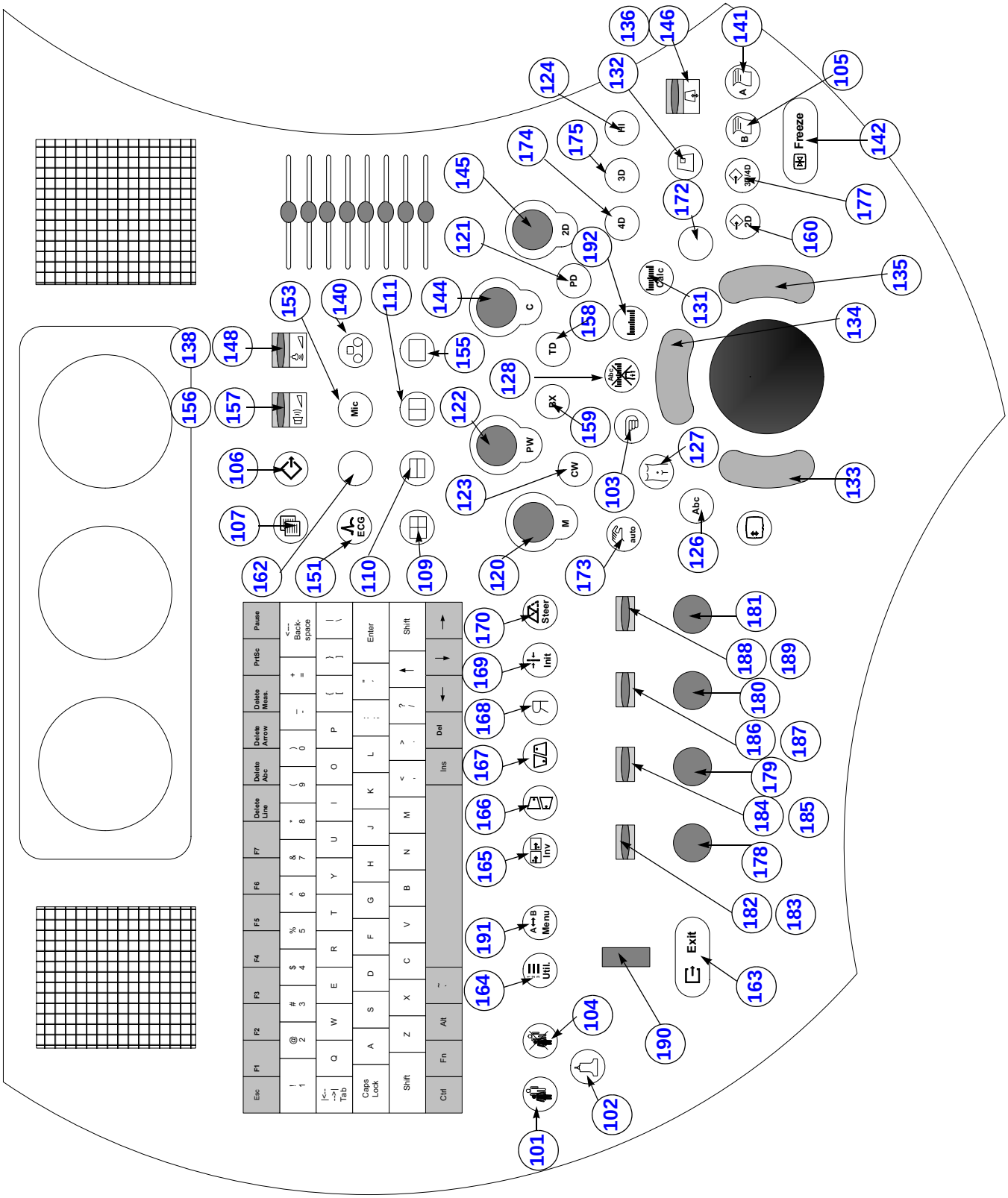


Figure 5-27 Voluson® 730Pro/ProV - Control Console

Table 5-5 Voluson® 730Pro/ProV - key codes

key code	Description	Voluson® 730Pro/ProV - Functionality	X	X	X
101	PID (patient identification)	call-up of the patient data entry menu			
102	Probe	call-up of the probe program menu			
103	Indicator	displays a pointer arrow or hand			
104	End Exam	Patient and measurement data are stored in the “Data manager”			
105	Print_b	Remote printer trigger key B			
106	Sonoview	to shift from scan mode to Sonoview			
107	Report	call-up of the Patient report page			
109	Quad Format	Quad-Screen format			
110	Dual Format (V)	Dual-Screen format (vertical distribution)			
111	Dual Format (H)	Dual-Screen format (horizontal distribution) - not yet implemented			
120	Mode_Switch1	M-Mode (Motion mode)			
121	Mode_Switch2	PD-Mode (Power Doppler) and HD-Mode (Bi-Directional Angio)			
122	Mode_Switch3	PW-Mode (Pulsed Wave Doppler)			
123	CW	Continuous Wave Doppler			
124	HI	Harmonic Imaging			
126	Text	Image documentation - to write onto the screen			
127	Bodymark	Bodymark display - to enter Bodymark symbols			
128	ClrScreen	to clear graphics, measurements and annotations on the screen			
131	MeasCalcs	Calculation tables			
132	HR_Zoom	High Resolution Zoom			
133	Trball_b	left trackball key			
134	Trball_a	upper trackball key			
135	Trball_c	right trackball key			
136	B_Depth	UP - penetration depth of the B-image			
138	AcousticPWr	UP - acoustic output (Power)			
140	VtrRec	call-up of the VCR Remote control menu			
141	Print_a	Remote printer trigger key A			
142	Freeze	Read/Write (Freeze/Run)			
144	Mode_Switch4	C-Mode (Color Flow mode)			
145	Mode_Switch5	2D-Mode (B mode)			

Table 5-5 Voluson® 730Pro/ProV - key codes

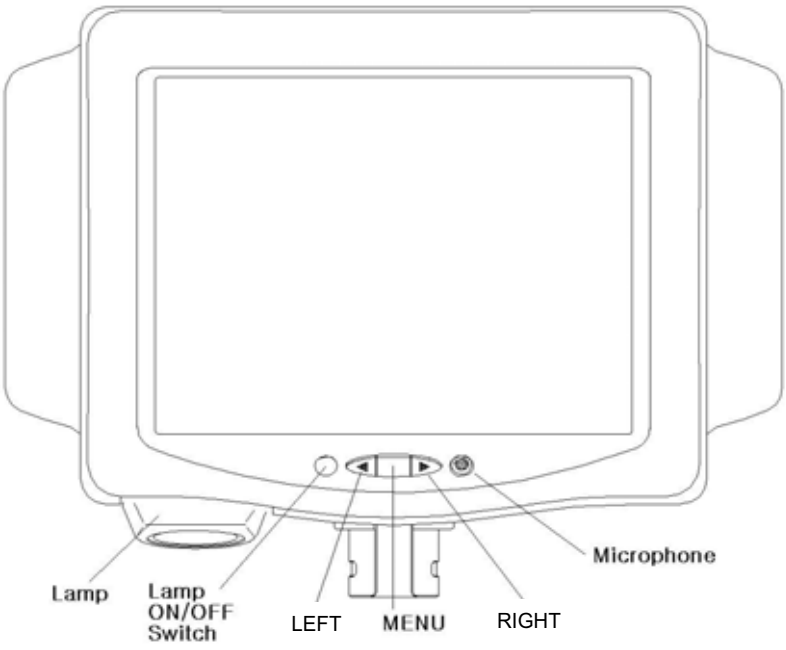
key code	Description	Voluson® 730Pro/ProV - Functionality	X	X	X
146	B_Depth	DOWN - penetration depth of the B-image			
148	AcousticPWr	DOWN - acoustic output (Power)			
151	ECG	ECG line ON/OFF			
152	Trackball Navigation	Trackball menu Navigation			
153	MIC	Microphone			
155	Single Format	Single-Screen format			
156	Speaker Volume	UP - speaker volume			
157	Speaker Volume	DOWN - speaker volume			
158	SieScape	XTD-View (Extended View)			
159	BiFlow	B-Flow			
160	Save 2D	to save/send 2D images and sequences			
161	Save Menu	Save Menu - to save/send images (volumes)			
162		NOT USED			
163	Exit	Exit			
164	Utilities	Utilities Menu			
165	Invert	Invert			
166	Left/Right	image orientation of 3D-image			
167	UP/Down	up/down image orientation			
168	Mirror	left/right image orientation			
169	Init	reset to initial position in volume mode			
170	Steering	Beam steering			
172		NOT USED			
173	OTO	Automatic Optimization			
174	4D-Mode	4D-Mode ON/OFF			
175	3D-Mode	3D-Mode ON/OFF			
177	Save 3D/4D	to save/send 3D and 4D images and sequences			
178	Soft 1	Soft_Switch 1			
179	Soft 2	Soft_Switch 2			
180	Soft 3	Soft_Switch 3			
181	Soft 4	Soft_Switch 4			
182	Soft_Flip 1	UP - Soft Flip 1 (Toggle switch function)			

Table 5-5 Voluson® 730Pro/ProV - key codes

key code	Description	Voluson® 730Pro/ProV - Functionality	X	X	X
183	Soft_Flip 1	DOWN - Soft Flip 1 (Toggle switch function)			
184	Soft_Flip 2	UP - Soft Flip 2 (Toggle switch function)			
185	Soft_Flip 2	DOWN - Soft Flip 2 (Toggle switch function)			
186	Soft_Flip 3	UP - Soft Flip 3 (Toggle switch function)			
187	Soft_Flip 3	DOWN - Soft Flip 3 (Toggle switch function)			
188	Soft_Flip 4	UP - Soft Flip 4 (Toggle switch function)			
189	Soft_Flip 4	DOWN - Soft Flip 4 (Toggle switch function)			
190	Menu Selector (Wheel Switch)	Menu Navigation wheel			
191	Change Menu	Change Menu			
192	Measure_User	Basic Measurements			

NOTICE Key codes which are not listed in the table are not available at Voluson® 730Pro/ProV.

Section 5-8
Monitor



KEY FUNCTION

a. MENU KEY
This button will enable the On Screen Display.
This button is also used to select the function in the Main Menu or to save the setting in the Sub Menu. (Push for 3sec)

b. DECREASE ◀ [LEFT]
Use this button to move down the OSD selection menu and adjust the attribute of the monitor while in OSD mode. Pressing this button out of the OSD menu allows you to decrease the level of contrast of the display screen.

c. INCREASE ▶ [RIGHT]
Use this button to move up the OSD selection menu and adjust the attribute of the monitor while in OSD mode. Pressing this button out of the OSD menu allows you to increase the level of contrast of the display screen.

d. LAMP ON/OFF
Lamp ON/OFF S/W

e. MICROPHONE
Allows to record voice

NOTE: There is no function of microphone.

Figure 5-28 Monitor Adjustment buttons

For further details refer to: Section 6-3 "Monitor Adjustment" on page 6-2.

Section 5-9
External I/O

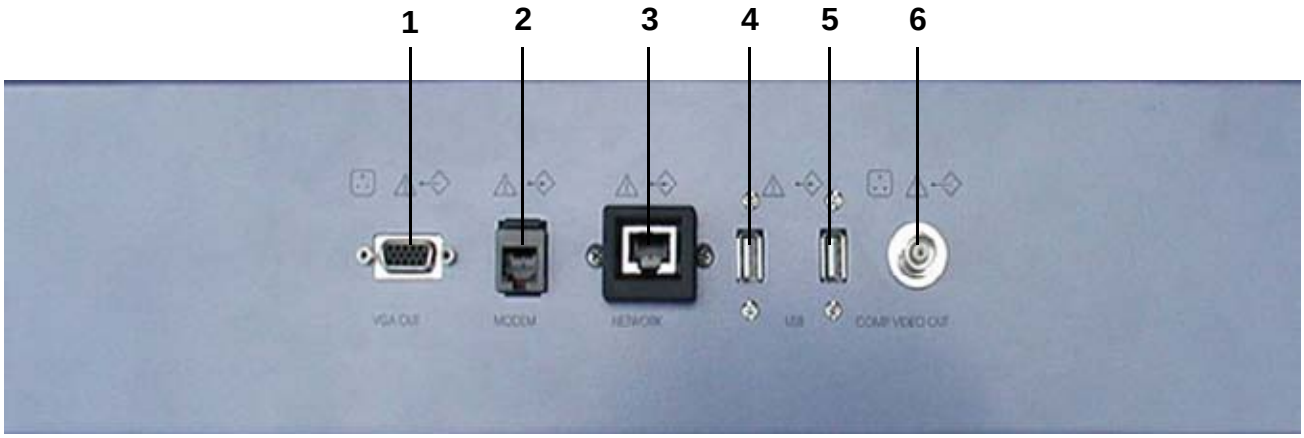


Figure 5-29 External I/O Panel Connectors

Table 5-6 External I/O Connector Description

Item	Connector Name	Description
1	VGA OUT	print out VGA signal with monitor/printer
2	MODEM	RJ-11 with global adapter kit for modem connection
3	NETWORK	DICOM input/output twisted pair RJ-45 10/100 megabit/s
4	USB-1	USB port
5	USB-2	USB port
6	COMP VIDEO OUT	BNC Connector, Color Video Output

Section 5-10
Peripherals

5-10-1 General Information

The GEM Module contains the DVD/CD+(R)W Drive.
Additionally the Magneto Optical Drive and the ECG-preamplifier (MAN6) can be installed as an Option.

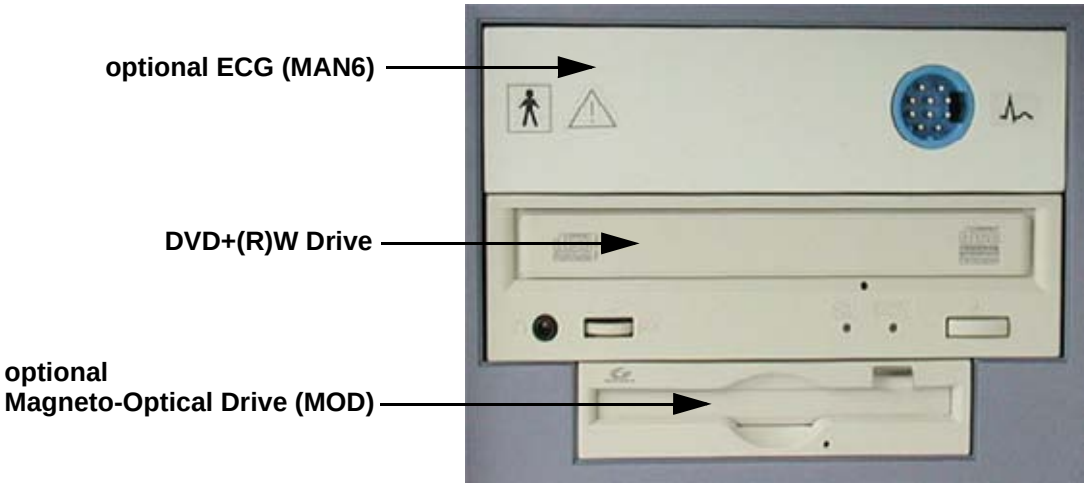


Figure 5-30 GEM incl. optional MOD and ECG

5-10-2 ECG-preamplifier (MAN6 - optional)

The ECG-preamplifier is used for acquiring an ECG-signal to be displayed with the ultrasound image. This optional peripheral serves for gaining an ECG-signal to mark the systolic and end diastolic moments in M-Mode and Doppler evaluations.

The ECG-preamplifier must not be used for ECG-diagnostics. It is not intended for use as a cardiac monitor and must not be used for an intraoperative application on the heart.

5-10-3 DVD/CD+(R)W Drive

The DVD/CD+(R)W Drive (Writer) is used to backup images and reports. In addition, it is used as the main source of software upgrades and other service utility operations. The DVD/CD+(R)W Drive can read/write CD´s and DVD´s.

5-10-4 Magneto-Optical Drive (optional)

Storage capacity by disk: 1.3GB, 640MB, 540MB, 230MB, 128MB

The MO-Drive allows to read and write any GIGAMO standard 1.3GB disk at twice the liner bit density. Additionally it retains full read/write compatibility with ISO/IEC 3.5 - inch disks ranging from original 128MB to current 640MB.

MO disks are nearly indestructible and immune from the problems that plague magnetic media.
MO disks can be rewritten an unlimited number of times.

Section 5-11
Power Distribution

5-11-1 CPN - Primary Power Module

Figure 5-31 Primary Power Module - CPN

5-11-1-1 Mechanical Concept and Overview

The AC Power's main tasks are to supply the various internal subsystems with AC power and to galvanically isolate the scanner from the on site Mains Power System. To reduce inrush current, an inrush current limiter is implemented.
Voltage to peripherals can be configured to either 115 VAC or 230 VAC.

The mains cord has plugs in both ends. A female plug connects to the scanner and a male plug to the mains outlet on site.

From the Mains Power Input module, the AC power is routed via an Inrush Current Limiter to a internal outlet connector for the Mains Transformer.

5-11-1-2 Major Functions of CPN

- Inrush Current limiter
- Power factor correction transformer for Sinus load for the mains voltage
- Power down Circuitry + Standby-Switch
- The CPN module generates 57VDC (+/-2V) as an input voltage for the Secondary Power supply of the GEZ module.
- The CPN module contains also the isolation transformer for the peripherals.
  (Maximum load: 350VA) see: Basic User Manual Chapter 23 Technical Data/Information

NOTE: All DC-supply voltages for built in peripherals are generated in GEZ-module not inside CPN.

NOTE: The system mains supply input voltage can be set to: 100V, 115V, 130V, 230V, 240V.
The output voltages may be set to 115V or 230VAC (independent from the input voltages).

5-11-1-3 Fuses on Rear Panel

F1 + F2: The main Input voltage is fused by two 16 Ampere fuses (rated current 16A) labeled F1 and F2.

F3: The AC Output voltage (115/230V) is fused by either:
• a 1.6 Ampere / 250V fuse for auxiliary output voltage 230 VAC
• a 3.2 Ampere / 250V fuse for auxiliary output voltage 115 VAC

F4: 16 Ampere fuse for the input voltage for the switching power supply generating the DC-Supply voltage for the Secondary power supply inside GEZ-Module

Figure 5-32 Fuses of CPN

5-11-1-4 Fuses inside CPN

F1 on CCF board: fuses the surge current limiter circuit.

NOTE: If this fuse is blown, the NTC (limiting the surge current will remain hot during system operation and if the system is switched off/on within a few seconds the surge current could be to high. Because of this reason Fuse F1 on CPN Rear Panel or the Hospital circuit fuse could be blown.

5-11-2 Disk Drive Module (GEM)

The check points for the drives voltages can be found at the AUX Supply connector (= GEM Power connector) on Backpanel of GEZ-Box; see: Section 7-3 "Check Points Voltages" on page 7-3.

- MO drive is supplied by +5V only
- DVD/CD drive is supplied by both +5V and +12 V
- Fan on the GEM module needs only 12 V power.

5-11-2-1 Fuses on CPE-Board for Disk Drive Module (GEM)

Description of fuses: 5A / 250V / slow-blow fuse / 5 x 20 mm

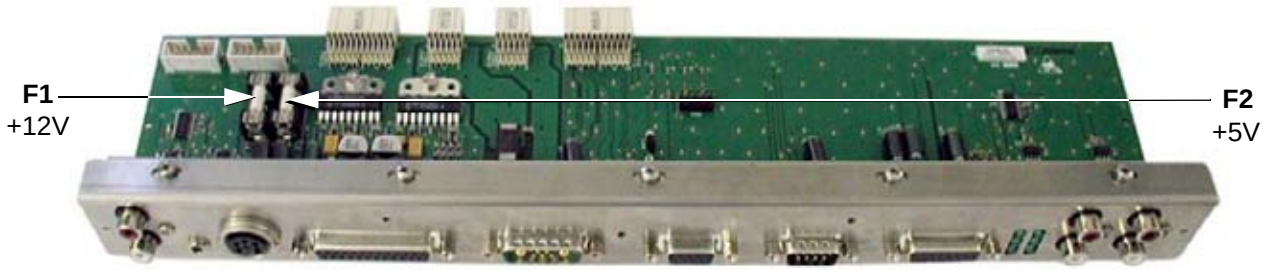


Figure 5-33 fuses for disk drives

Section 5-12
Mechanical Descriptions

5-12-1 Physical Dimensions

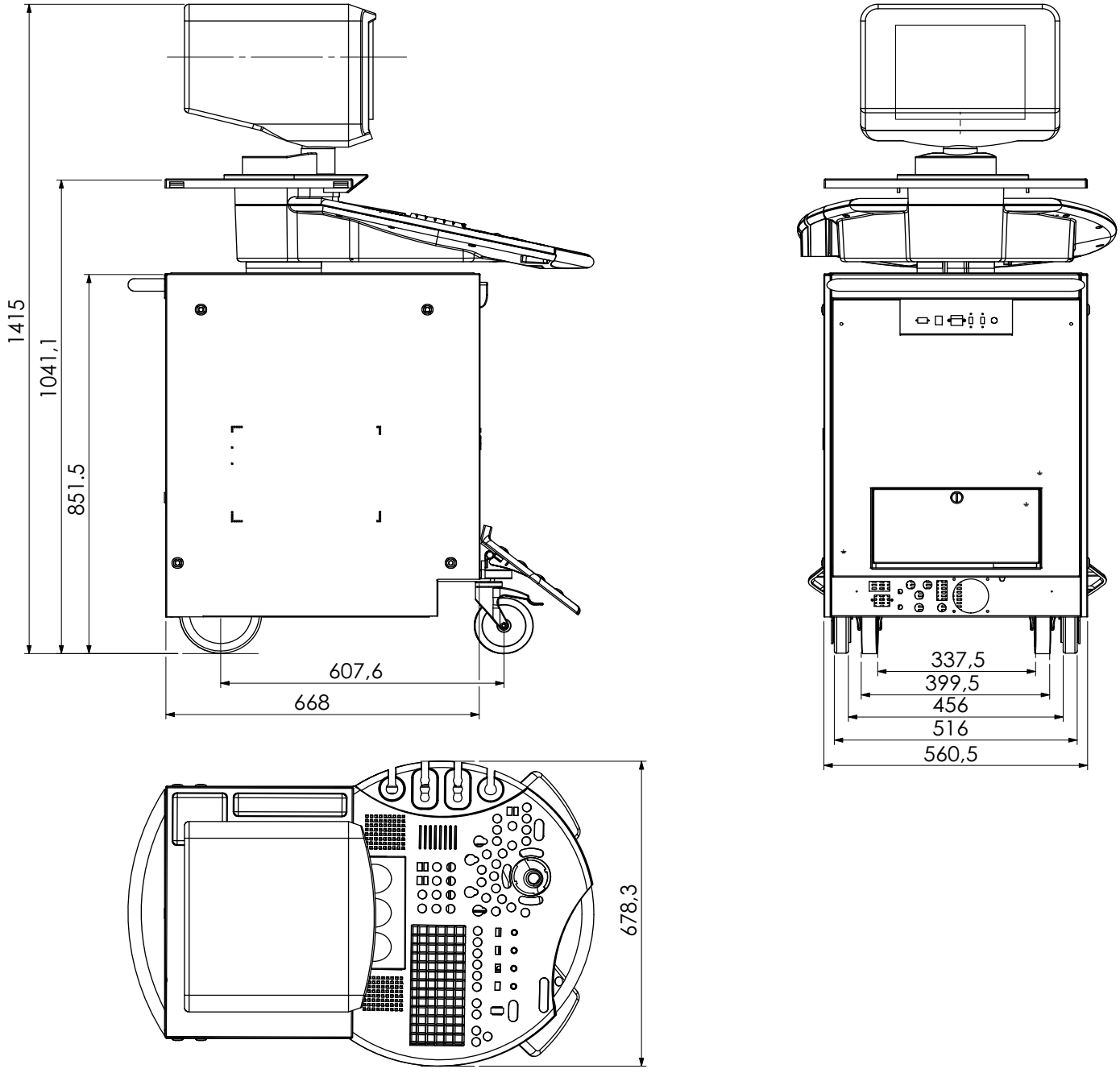


Figure 5-34 Physical Dimensions

5-12-2 Monitor

- Tilt: 11° forwards and backwards
- Swivel: +/-90° rotation.

5-12-3 Top Console Positioning

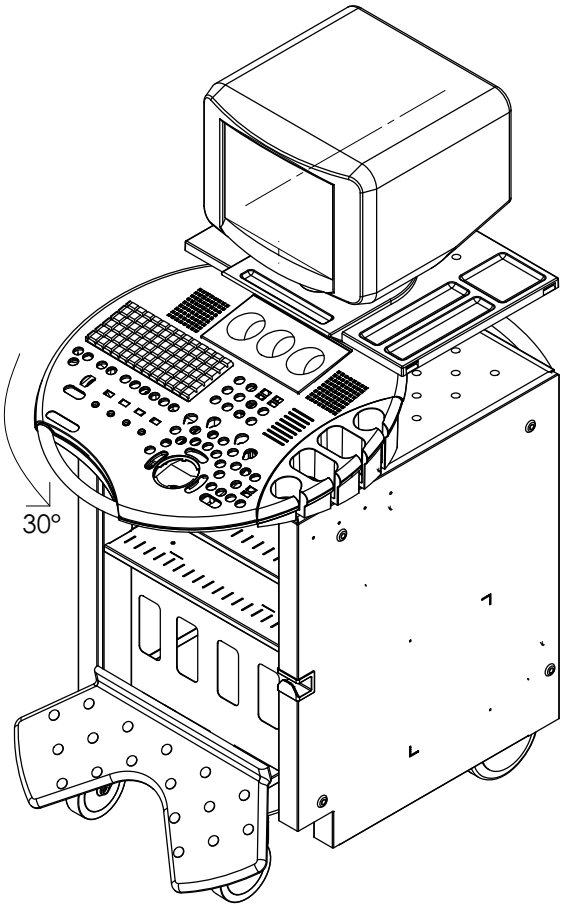


Figure 5-35 Top Console Positioning

5-12-4 Rotation of the Control Console

Locking Lever
for locking and unlocking the control console

Figure 5-36 Locking lever under Control Console

- Horizontal Access: The control panel offers 30° of horizontal adjustment to the right.

5-12-5 Assembly Drawing GW & GEU & Monitor

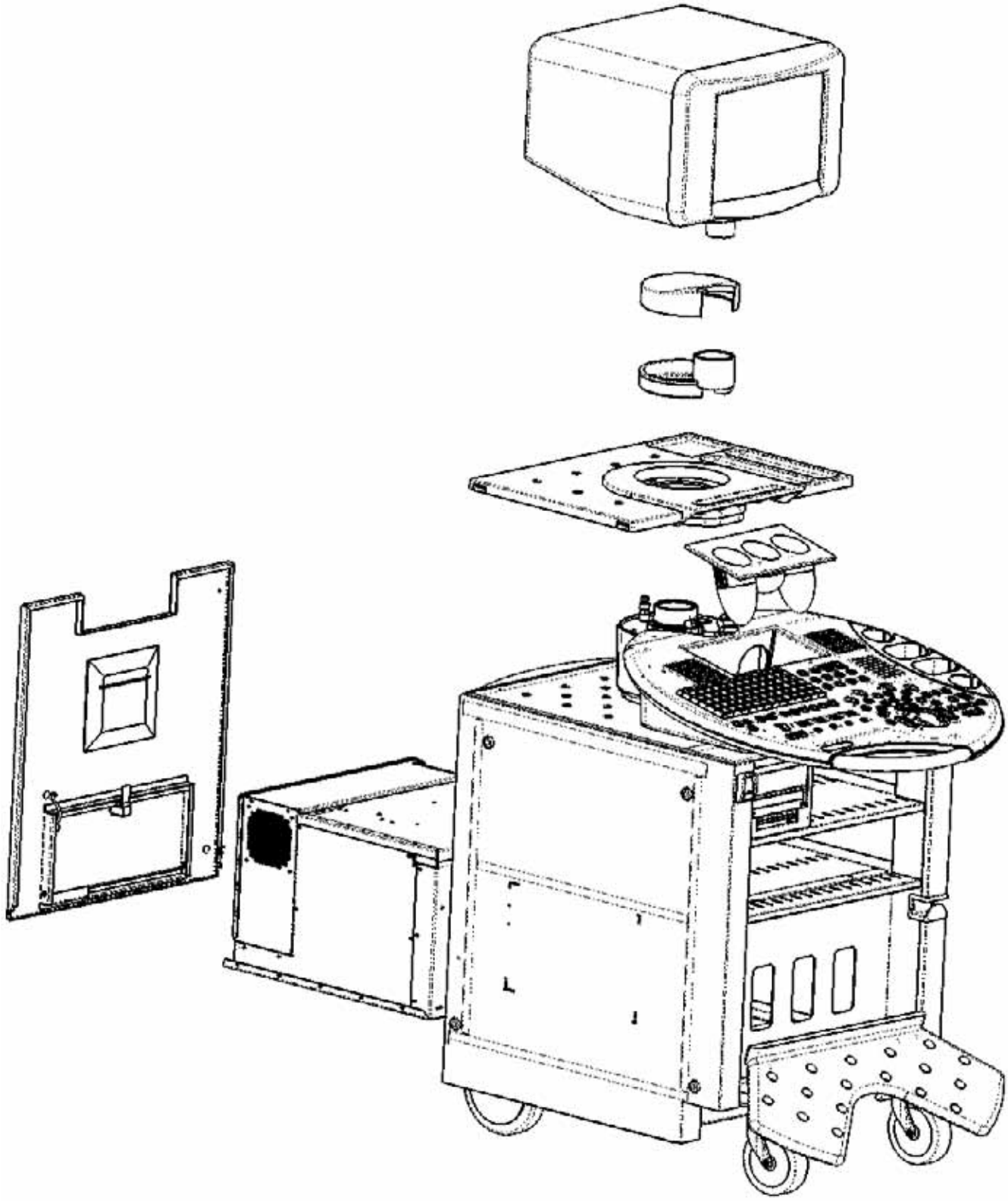


Figure 5-37 Assembly Drawing Voluson® 730Pro/ProV

Section 5-13
Air Flow Control

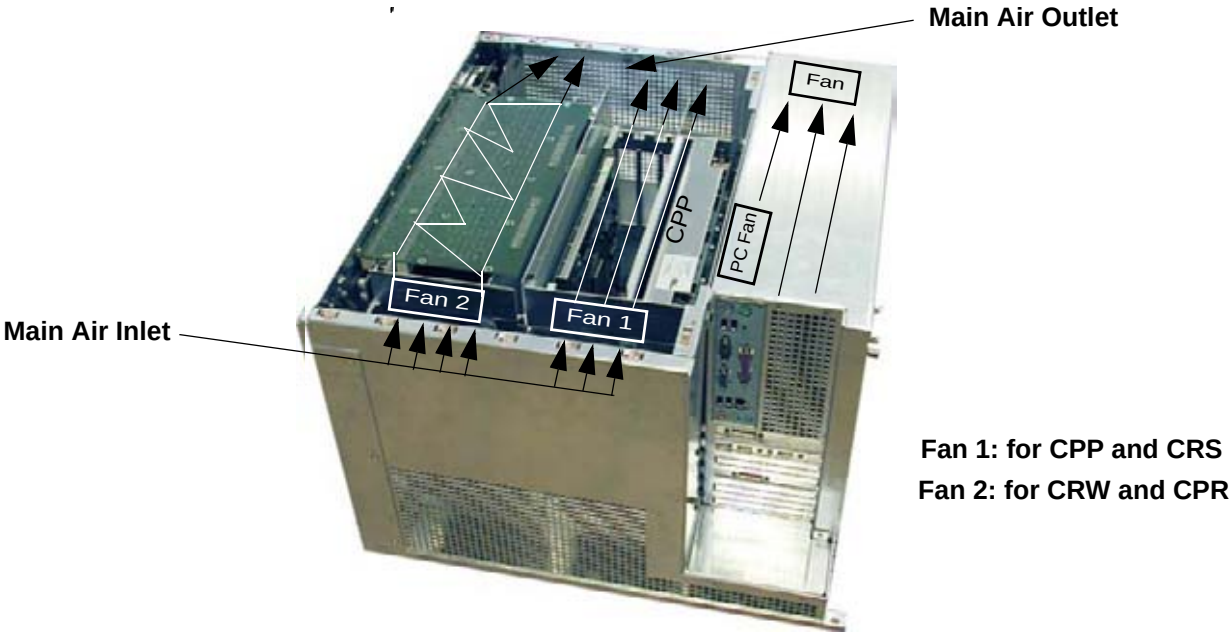
5-13-1 Air Flow Distribution

The fans at the right side of the Main Board Chassis draw air into the scanner, through the filter grid, and pushes it through the card rack.

Air holes in the left and right side of the rack allow the air to move down through the card rack. Air exits the scanner through holes the Main Air Outlet at the left side panel.

5-13-1-1 Air Flow Distribution Overview

Figure 5-38 Console Views



Fan 1: for CPP and CRS
Fan 2: for CRW and CPR

Figure 5-39 Air Flow Control

Section 5-14
Service Platform

5-14-1 Introduction

The Service Platform will increase service productivity and reduce training and service costs. This web-enabled technology provides linkage to e-Services, e-Commerce, and the iCenter, making GE's scanners more *e-enabled* than ever.

The Service Platform contains:

- specific software/hardware test modules, system setup, update, etc. for Voluson systems; see: Section 5-15 "Service Page" on page 5-57.

5-14-2 Access / Security

The Service Platform has different access and security user levels.
Each user is only granted access to the tools that are authorized for their use.

5-14-3 *iLinq* Interactive Platform

Many of the services of the Service Platform come from its integration with *iLinq*.

If an iLinq checkout was performed on the Voluson® 730Pro/ProV, the ILINQ selection item is available in the menu area (on the left side of the screen) of the “Utilities” menu.
By selecting this item, the Netscape® browser starts the “iLinq Home Page”.

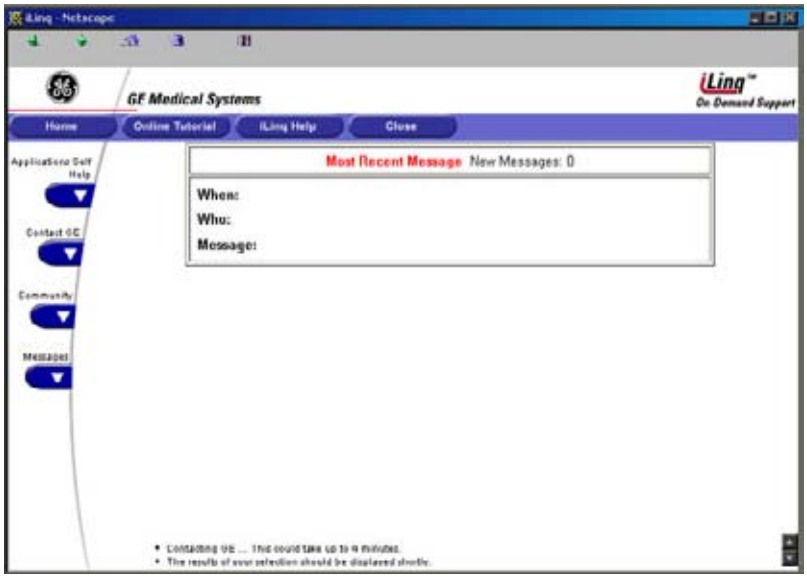


Figure 5-40 iLinq Home Page

Section 5-15
Service Page

5-15-1 Introduction

The Service Page contains specific software/hardware test modules, system setup, update, etc. for Voluson systems only.

5-15-2 Access / Security

The service page has different access and security user levels.
Each user is only granted access to the tools that are authorized for their use.

5-15-3 Service Login

1.) Press the **UTILITIES** key on the Control Panel. The menu area changes to the Utilities menu.
2.) Select the SYSTEM item from the menu area to activate the setup desktop screen.
3.) Select the SERVICE page. The “password window” appears automatically.

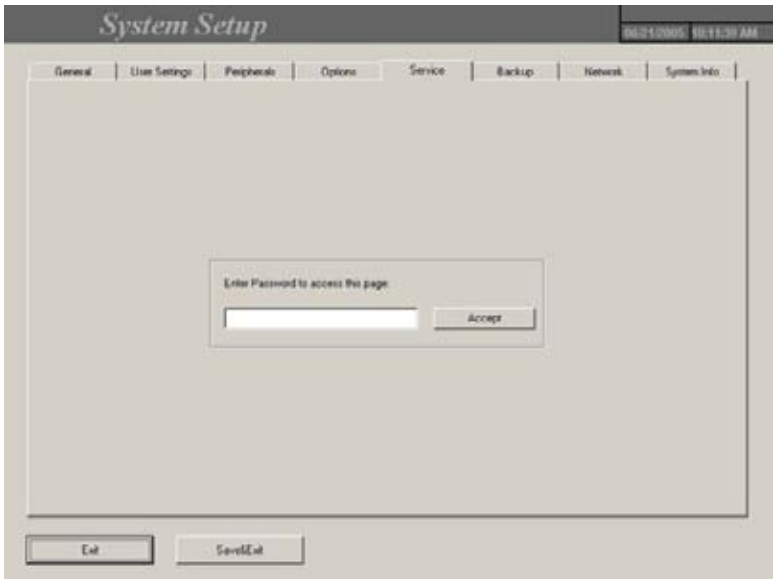


Figure 5-41 System Setup Service page

4.) Enter the password SHE and click the ACCEPT button to display the Service Tools window.

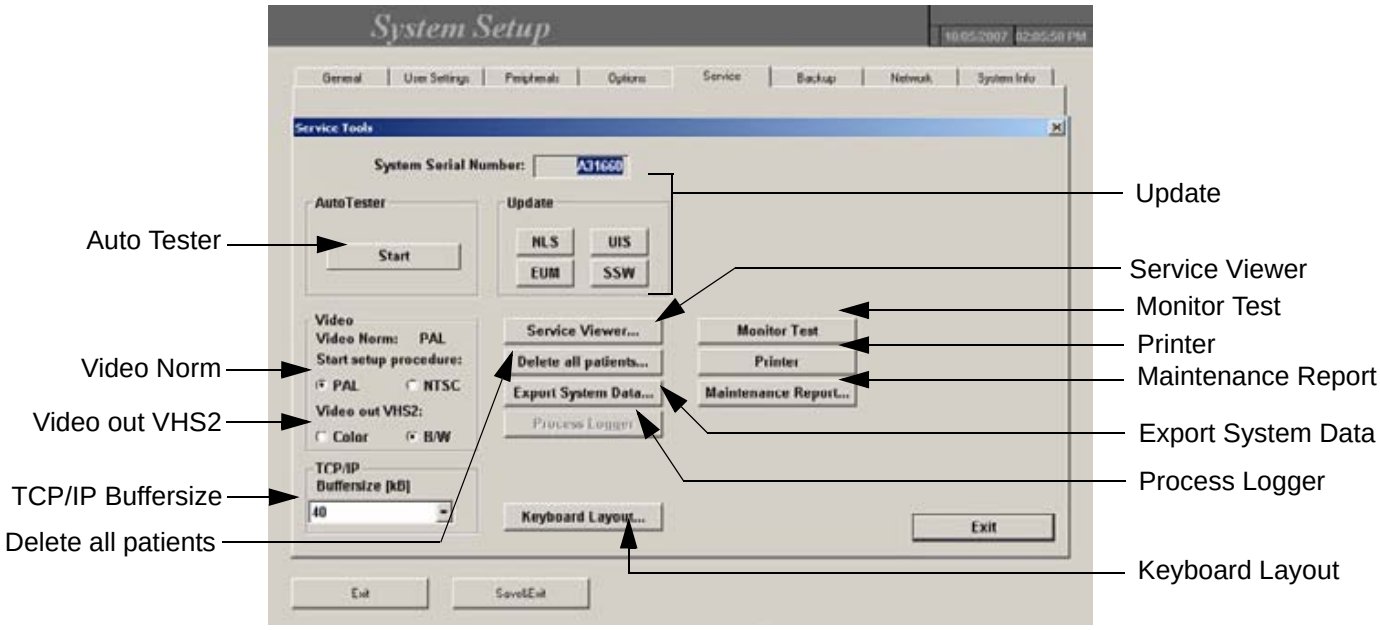


Figure 5-42 Service Tools window

5-15-3-1 Auto Tester File

Autotest is a log function of customer activities. It records all user actions (scanning, entries, performing Calculations, review of Patient Reports, etc.…). It is possible to safe (record) as file on HDD. But also export to DVD/CD or MOD can be done to allow replay of the records on other units.

NOTICE For intermittent problems this file can be requested from the Service Engineer or customer. It is possible to burn this file on DVD/CD+(R)W or to store it on MO-disk.

Operation see: Section 7-5 "How to use the Auto Tester program" on page 7-7.

5-15-3-2 Video Norm

To change to Video Norm from PAL(50Hz) to NTSC(60Hz) or vice versa.
Operation see: Section 3-8-1-6 "How to change Video Norm" on page 3-63.

5-15-3-3 Video out VHS2

Factory setting is **B/W.** Only VHS2 output can be modified (Color – B/W)

5-15-3-4 Process Logger

The Process Logger is a separate software application that runs on the system. It is used for detecting software problems and their root causes. Process information and thread information is gathered in cycle time intervals, compressed and written to a file which is located on D:/export.

NOTE: This tool must not be used. Please contact your service representative.

5-15-3-5 Keyboard Layout

To change the keyboard layout to different languages.
Operation see: Section 6-6 "Modification of Keyboard Layout" on page 6-7.

NOTE: Reconfigure the layout of the keyboard is only useful by changing the concerned keys also.
see: Section 8-14 "Replacement of Key Caps (by special native language keys)" on page 8-26

5-15-3-6 TCP/IP Buffersize

The TCP/IP Buffersize selects the amount of buffer memory used for DICOM transfers (both directions).

5-15-3-7 Service Viewer

Provides common information about System Temperature, Probes, Working hours of system components and probes.

1.) Select the SERVICE VIEWER button to get access to the E-Service page.

Figure 5-43 Kretztechnik E-Service

5-15-3-8 Delete all Patients

1.) Click the DELETE ALL PATIENTS button. Following WARNING message appears on the screen.

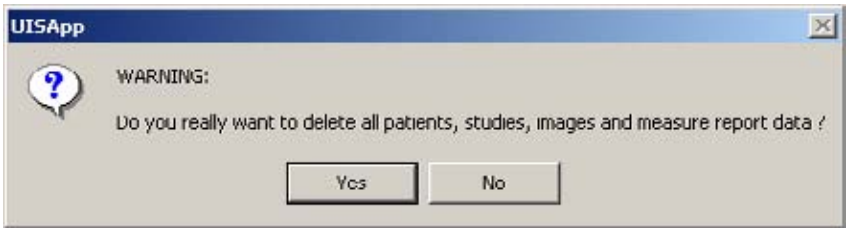


Figure 5-44 Warning message

WARNING ***If you select the YES button, all patients data, studies, images and measure report data will be deleted permanently from the hard disk and cannot be recovered!***

5-15-3-9 Export System Data

Select the EXPORT SYSTEM DATA button on the “Service Tools” page to export dump-files and text files, the full Service Database informations about probes, boards, Software, Options, Service Actions and the Event Log File to the DVD/CD Drive (or the optional MO Drive).
Operation see: Section 7-4-2 "Export Log's and System Data" on page 7-4.

5-15-3-10 Maintenance Report

Any modification upgrade and maintenance action should be entered in this report to get a history of all service actions.

1.) Click the MAINTENANCE REPORT button. The following message box will be displayed.

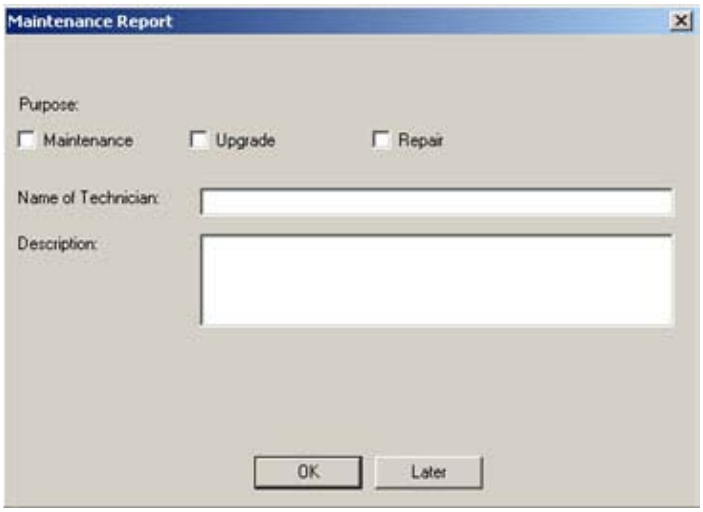


Figure 5-45 Maintenance Report

2.) Fill in the requested information and click OK.

3.) Click the EXIT button on the Service Tools window and the EXIT button on the System Setup Service page.

NOTE: After Hardware or Software modifications normally the "Maintenance Report" message box (see: Figure 5-45) appears automatically on the screen.

5-15-3-11 Monitor Test

1.) To perform the Monitor test, select the MONITOR TEST button.

The following message appears on the screen.

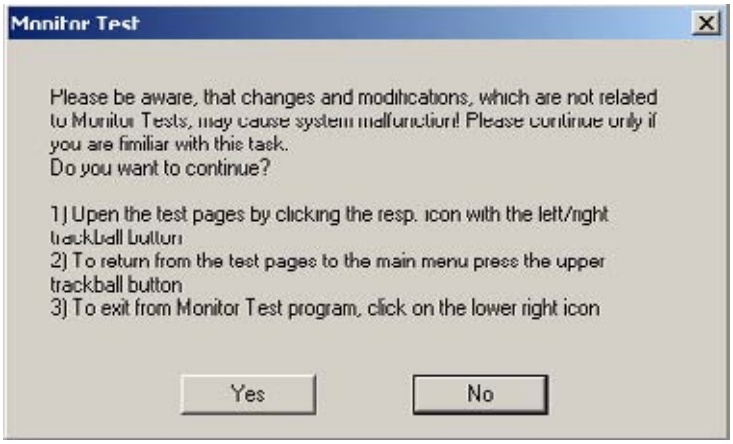

Monitor Test
Please be aware, that changes and modifications, which are not related to Monitor Tests, may cause system malfunction! Please continue only if you are fimiliar with this task.
Do you want to continue?
1) Open the test pages by clicking the resp. icon with the left/right trackball button
2) To return from the test pages to the main menu press the upper trackball button
3) To exit from Monitor Test program, click on the lower right icon
Yes
No

Figure 5-46 Monitor Test - Instructions

2.) Read the displayed instructions. Afterwards confirm with YES.

The Monitor Test main menu appears on the screen.

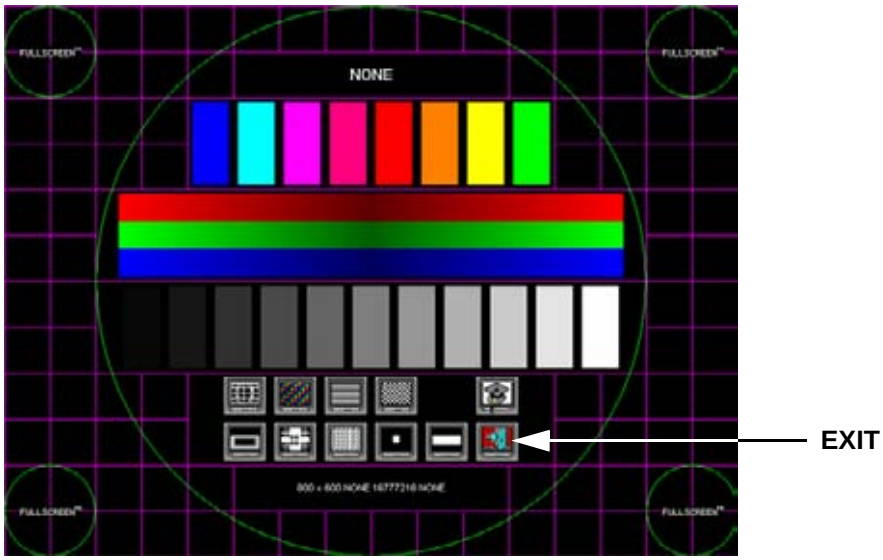


Figure 5-47 Monitor Test - Main menu

3.) Open the desired test page: select the respective icon and press the **right/left trackball** key.

4.) To return to the Main menu, press the **upper trackball** key.

5.) To exit the Monitor Test program, click the “Exit” icon.

5-15-3-12 Printer

Printer installation is possible without entering the Windows Desktop.
Operation see: 3-7-5 "Printer Installation manually" on page 3-47.

WARNING ***Only accessories explicitly recognized and released by the system manufacturer GE Medical Systems - Kretztechnik may be used in connection with the system.***

5-15-3-13 Update

NLS Reserved for loading Software patches.

EUM is for updating the **E**lectronic **U**ser **M**anual
Operation see: Section 8-6 "Electronic User Manual (EUM) Upgrade Procedure" on page 8-13.

UIS is for updating the Ultrasound Application Software
Operation see: Section 8-2-5 "Software - Installation Procedure (via Service Page)" on page 8-7.

SSW is for updating the Service Software
Operation see: Section 8-5 "Service Platform (SSW) Upgrade Procedure" on page 8-11.

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Chapter 6
Service Adjustments

Section 6-1
Overview

6-1-1 Purpose of Chapter 6

This chapter describes how to test and adjust the mechanical capabilities of a scanner that may be out of specification. Although some tests may be optional they should only be performed by qualified personnel.

Table 6-1 Chapter 6 Contents

Section	Description	Page Number
6-1	Overview	6-1
6-2	Regulatory	6-1
6-3	Monitor Adjustment	6-2
6-4	Control Console, Transport Lock	6-5
6-5	Trackball Adjustment	6-6
6-6	Modification of Keyboard Layout	6-7
6-7	Daylight Saving Time (DST) - New Dates	6-9

Section 6-2
Regulatory

Verify, where applicable, that any regulatory information or tests required by national law are present and accounted for, and any regulatory tests required by national law are performed *and* documented.

Section 6-3
Monitor Adjustment

The Monitor can be tilted or rotated.

- Tilt angle: up/down 11°
- Rotation angle: right/left 90°

The digital control panel is located at the front of the color monitor. If you are not satisfied with the factory settings, use these controls to program those you prefer in each resolution. Then, these adjusted settings are kept in memory even if you change the resolution or turn off the monitor.

Figure 6-1 Monitor Adjustment buttons

- **Menu key:**
  This button will enable the On Screen Display (OSD-instructions). This button is also used to select the function in the Main Menu or to save the settings in the Sub Menu. (Push for 3 sec.)
- **Decrease (Left):**
  Use this button to move down the OSD selection menu and adjust the attribute of the monitor while in OSD menu. Pressing this button out of the OSD menu allows you to decrease the level of contrast of the display screen.
- **Increase (Right):**
  Use this button to move down the OSD selection menu and adjust the attribute of the monitor while in OSD menu. Pressing this button out of the OSD menu allows you to increase the level of contrast of the display screen.

6-3-1 Monitor Calibration

NOTE: Please warm up the monitor for 5-10 minutes before starting calibration.

This procedure consists of 7 parts:

1.) Degauss
2.) Color Temp - Calibration
3.) Contrast and Brightness
4.) Geometry
5.) Convergence
6.) Color temperature
7.) B-Mode Quality

6-3-1-1 Degauss

Degaussing refers to the process of removing magnetic-field effects from the monitor. Operation of the monitor within a magnetic field may adversely effect color purity. Degaussing can be used to correct the problem.

NOTICE The monitor should automatically degauss itself each time power is applied if you wait at least 10 seconds before you turn power back ON.

1.) Press and hold the **MENU** (middle) key (see: Figure 6-1) on the monitor controls for approximately 4 seconds till the OSD menu appears on the screen.
2.) Press the **RIGHT** button 2 times to the DEGAUSS and then press the **MENU** key again to select it.
3.) Wait till DEGAUSS is completed.

6-3-1-2 Color Temp - Calibration

1.) On the control panel, press the **UTILITIES** key.
2.) In the “Utilities” menu on the left side of the screen, select SYSTEM to invoke the setup desktop.
3.) Select the SERVICE page, enter the password SHE and click the ACCEPT button.
4.) Select the MONITOR TEST button in the “Service Tools” menu.
5.) Confirm the “Monitor Test” message with YES.

The Monitor Test main menu appears on the screen.

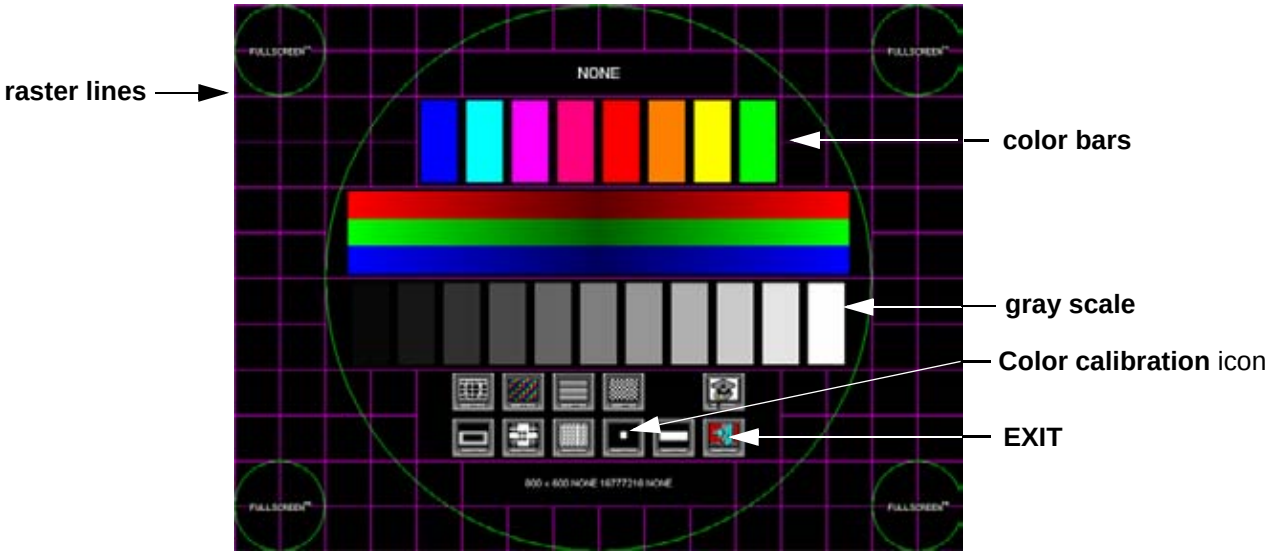

Figure 6-2 Monitor Test - Main menu

6.) Select the “Color calibration” icon and press the **right/left trackball** key once (monitor is white).
7.) Press and hold the **MENU** (middle) key on the monitor controls for approximately 4 seconds till the OSD menu appears on the screen.
8.) Press the **RIGHT** button 3 times to the COLOR TEMP and then press the **MENU** key to select it.
9.) Press the **RIGHT** button until CALIBRATION is highlighted and then press the **MENU** key again.

NOTE: The calibration cycle will immediately start for Red, Green and Blue. Wait till it´s completion message “It has completed...” appears. During the Calibration process do not touch any key.

10.) To return to the Main menu, press the **upper trackball** key 2 times.

NOTE: Contrast and Brightness (see: 6-3-1-3) has to be adjusted after color calibration.

6-3-1-3 Contrast and Brightness

Adjusting the monitor´s contrast and brightness is one of the most important factors for proper image quality. If these controls are set incorrectly, the Gain, TGC, Dynamic Range and even Acoustic Output may have to be changed more often than necessary to compensate.

The proper setup displays a complete gray scale. The lowest level of black should just disappear into the background and the highest white should be bright, but not saturated.

NOTE: Brightness and Contrast should be adjusted at examination room light conditions.
Typically values for Contrast and Brightness are 70 to 75, depending on the operator!

1.) Press the **MENU** (middle) key (see: Figure 6-1) on the monitor controls (= toggle button for contrast and brightness).
2.) Adjust the CONTRAST by pressing the **LEFT** or **RIGHT** button to decrease/increase the value.
3.) Press the **MENU** key again to toggle to brightness.
4.) Adjust the BRIGHTNESS by pressing the **LEFT** or **RIGHT** button to decrease/increase the value.

6-3-1-4 Geometry

Check the raster lines of the test pattern by referring to Figure 6-2.
Expected results:

1.) Squares are not distorted.
2.) Raster lines are straight.
3.) No keystone and pincushion distortion.
4.) Horizontal and vertical width is correct.

6-3-1-5 Convergence

Check the color of the raster lines (see: Figure 6-2).
Expected result:

Raster lines have only one color.

6-3-1-6 Color temperature

Check the grey scale and the color bars of the test pattern (see: Figure 6-2).
Expected results:

1.) “White“ is displayed **without** a tint (discolor).
2.) Colors are displayed correctly.
3.) To exit the Monitor Test program, touch EXIT.

6-3-1-7 B-Mode Quality

Connect an abdominal probe (AB or RAB), press the **PROBE** key, select the “Abdomen“ application and start the “Default“ program. Record a B-Image of the liver.

If there is no abdominal probe, record a B-Image of the Thyroid by using a small parts probe (SP6-12 or SP4-10) and the corresponding program.
Expected result:

Regular and homogenous B-Image without tint.

6-3-1-8 Screen Saver

If you install SW 5.4.x or higher, please adjust the better screensaver.

Section 6-4
Control Console, Transport Lock

6-4-1 Control Console

The control console can be rotated 30° to the right.

When rotating the control console grasp it only the front grip.

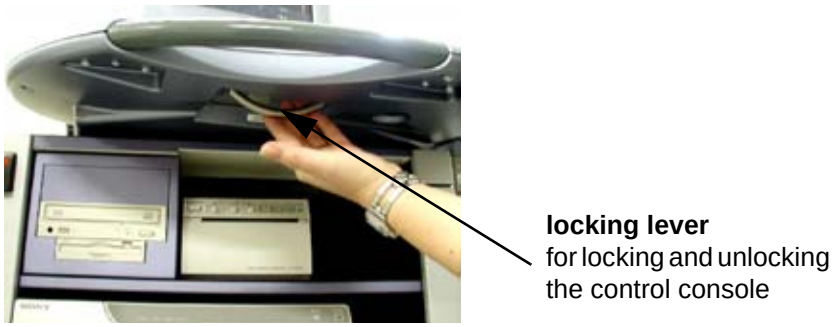

Figure 6-3 Locking Lever under Control Console

1.) Push the lever under the control console forward.
2.) Rotate the console to wanted position.

6-4-2 Transport Lock

There is a locking lever for locking and unlocking the control console, mounted at the front below the control console. When preparing the system for transport, the lock has to be engaged in order to secure the console against uncontrolled rotation. The lock catches in when the console is rotated to its center 0° position.

⚠ **WARNING** ***Do not put your hand between the control console and the Main unit when moving the console to the 0 position: Danger of injuries!***

Section 6-5
Trackball Adjustment

Adjustment of the mechanical movement may be necessary to ensure smooth running of the trackball.

1.) Remove the outer fixing ring by turning it counterclockwise.

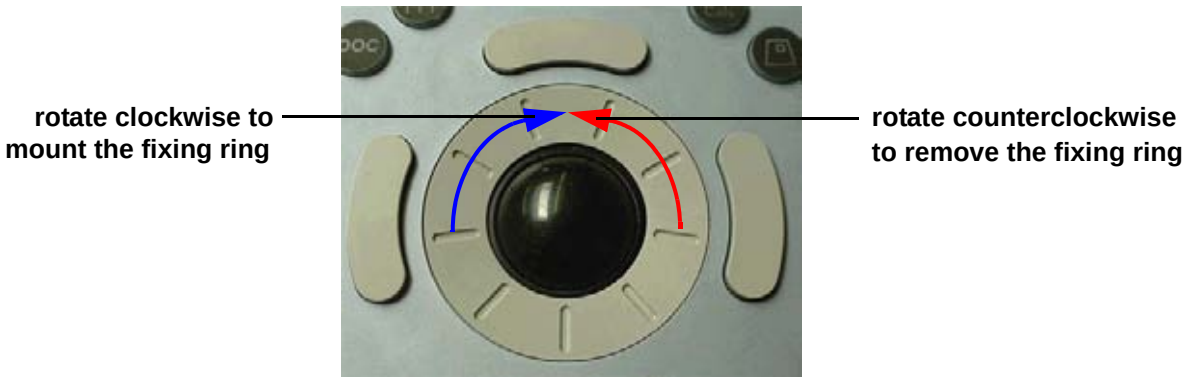

Figure 6-4 Trackball with fixing ring

2.) Adjust the trackball for smooth running by rotating the black securing ring.

- CCW: smooth run
- CW: tighten run

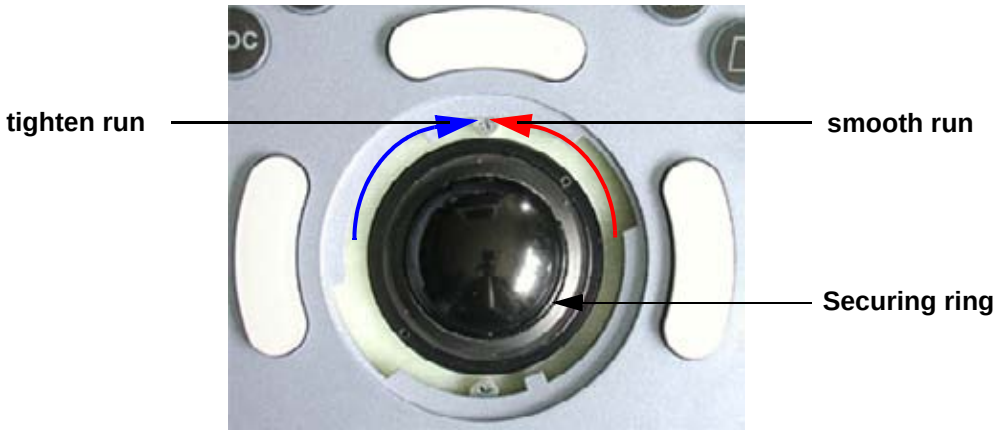

Figure 6-5 Trackball - Securing Ring

NOTICE Avoid tightening of thread caused by improper mounting of securing ring!

3.) Mount the outer fixing ring by turning it clockwise. see Figure 6-4.

Section 6-6
Modification of Keyboard Layout

NOTE: Configuring the layout of the keyboard is only useful by changing the concerned keys also. see: Section 8-14 "Replacement of Key Caps (by special native language keys)" on page 8-26.

6-6-1 Setup the Voluson® 730Pro/ProV Keyboard Language Layout

1.) Press the **UTILITIES** key on the Control Panel. The menu area changes to the Utilities menu.
2.) Select the SYSTEM item from the menu area to activate the setup desktop screen.
3.) Select the SERVICE page in the System Setup desktop.
4.) Enter the password SHE and click the ACCEPT button to display the Service Tools window.

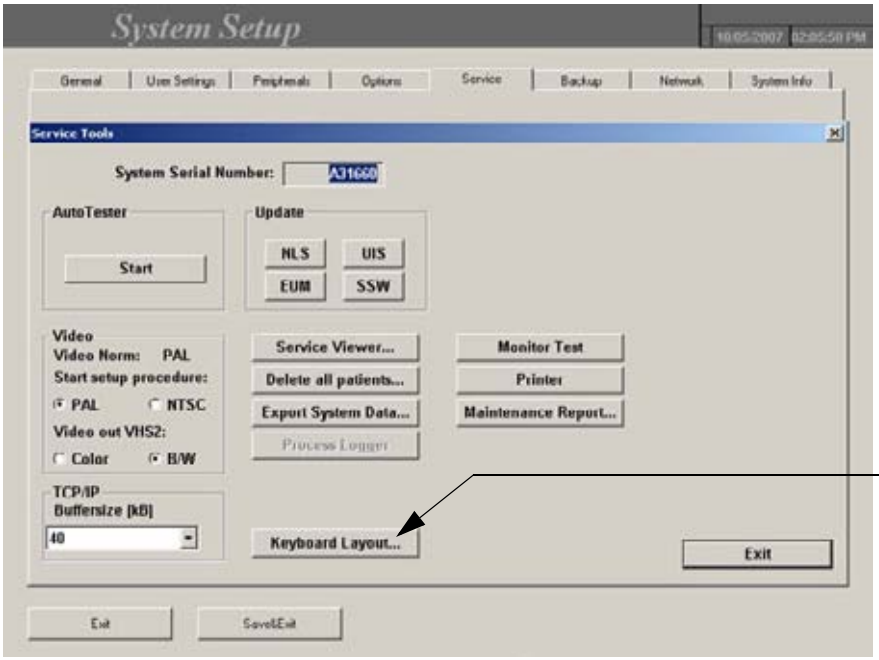

Figure 6-6 Service Page

5.) Click the KEYBOARD LAYOUT button on the service window.

6-6-1 Setup the Voluson® 730Pro/ProV Keyboard Language Layout (cont'd)

6.) In the **INPUT LOCALES** tab, select the default input language.

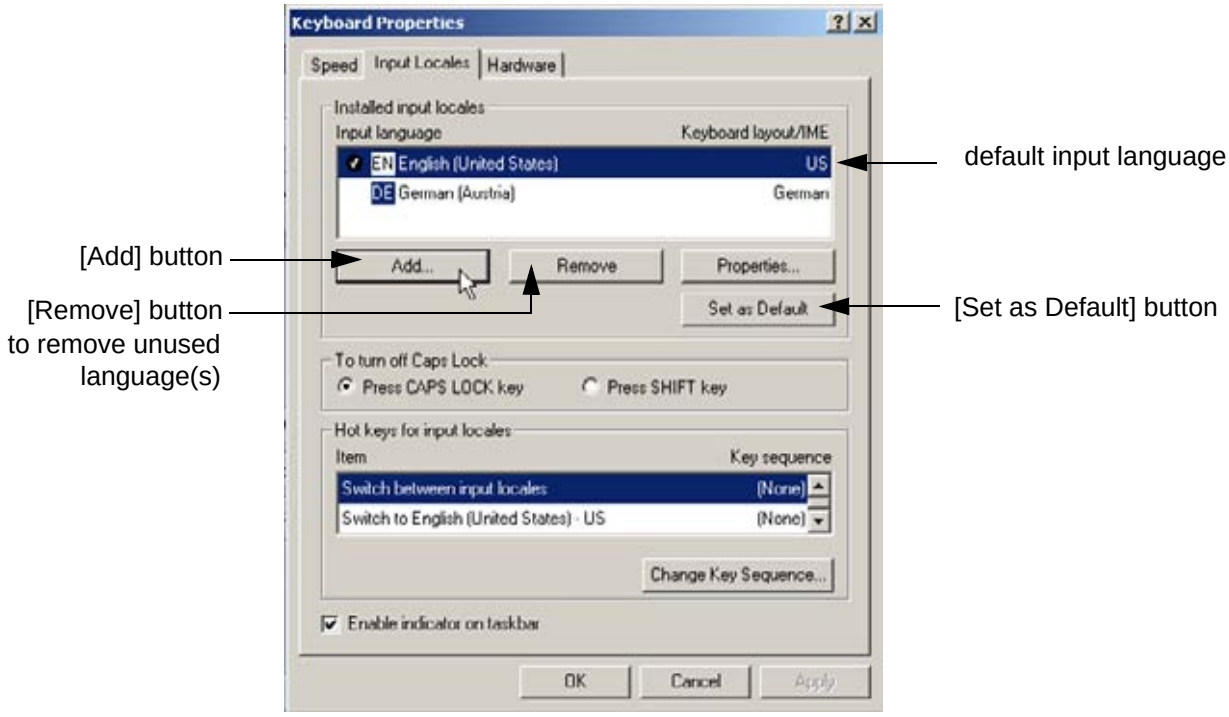

Figure 6-7 default input language

NOTE: If the desired language is not listed, click the ADD button, choose the desired input language from the drop down menu, as shown in Figure 6-8 below, and then confirm with OK.

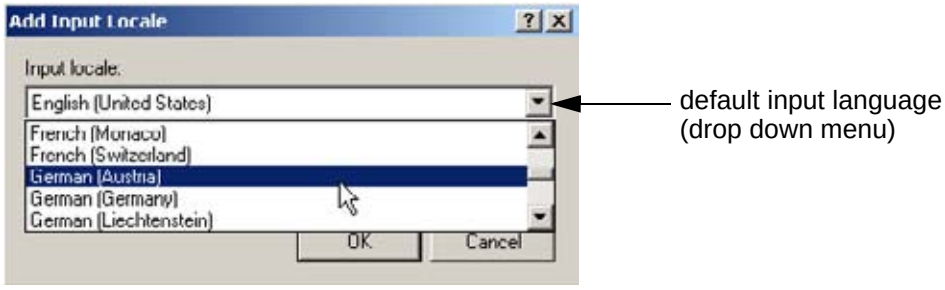

Figure 6-8 Add Input Locale

7.) Click the SET AS DEFAULT button.

8.) Click on APPLY and then close the window with OK.

9.) Close the Service page with the SAVE&EXIT button and restart the system.

10.) Reenter "Keyboard Layout" by repeating step 1.) to step 6.). This time remove unused language(s).

11.) Test the Keyboard function:

- Press the **ABC** key on the control panel.
- Press some keys on the keyboard and verify the entered text.

Section 6-7
Daylight Saving Time (DST) - New Dates

Issue: The automatic Daylight Saving Time feature in Microsoft Windows products may no longer run on the correct date, causing the system's time to be incorrect.

Cause: Some countries have changed their start and end dates for Daylight Saving Time (DST). Access Microsoft website http://support.microsoft.com/kb/928388 to determine if the system's location site is affected.

Solution: If the Voluson® 730Pro/ProV relies on the automatic DST feature in Microsoft Windows, turn off the feature and then set the correct system time manually at the start of DST and again at the conclusion of DST.

Procedure:

1.) Press the **UTILITIES** key on the Control Panel. The menu area changes to the Utilities menu.
2.) Select the SYSTEM item from the menu area to activate the setup desktop screen.
3.) Select the GENERAL page in the System Setup.
4.) Click the DATE/TIME button.
5.) In the displayed "Date/Time Properties" window select the **TIME ZONE** tab.
6.) Uncheck "Automatically adjust clock for daylight saving changes" check box and then click APPLY (see: left image of Figure 6-9 below).

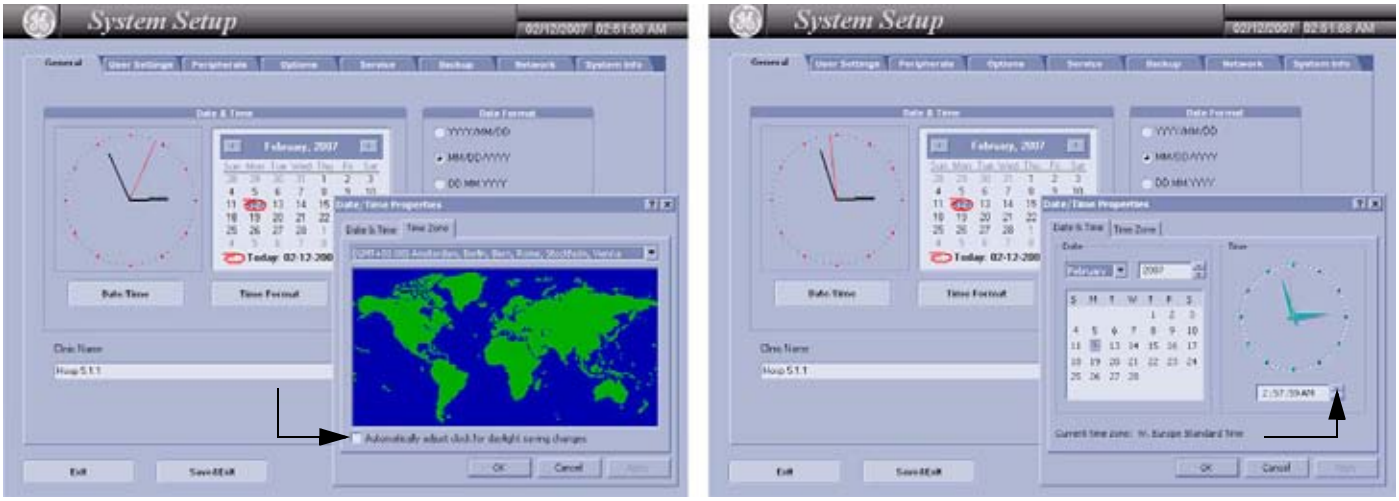

Figure 6-9 Uncheck check box / adjust time

7.) Select the **DATE / TIME** tab in the "Date/Time Properties" window.
8.) Set the proper time for the system's location and then click OK (right image of Figure 6-9, above).
9.) Click the SAVE&EXIT button to save your changes and exit the System Setup page.

The System is shutting down automatically and restarts again.

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Chapter 7
Diagnostics/Troubleshooting

Section 7-1
Overview

7-1-1 Purpose of Chapter 7

This section describes how to setup and run the tools and software that help maintain image quality and system operation. Basic host, system, and board level diagnostics are run whenever power is applied. Some Service Tools may be run at the application level.

7-1-2 Overview

There may be a time when it would be advantageous to capture trouble images and system data (logs) for acquisition through remote diagnostics (InSite) or to be sent back to the manufacturer for analysis. There are different options to acquire this data that would give different results.

Table 7-1 Contents in Chapter 7

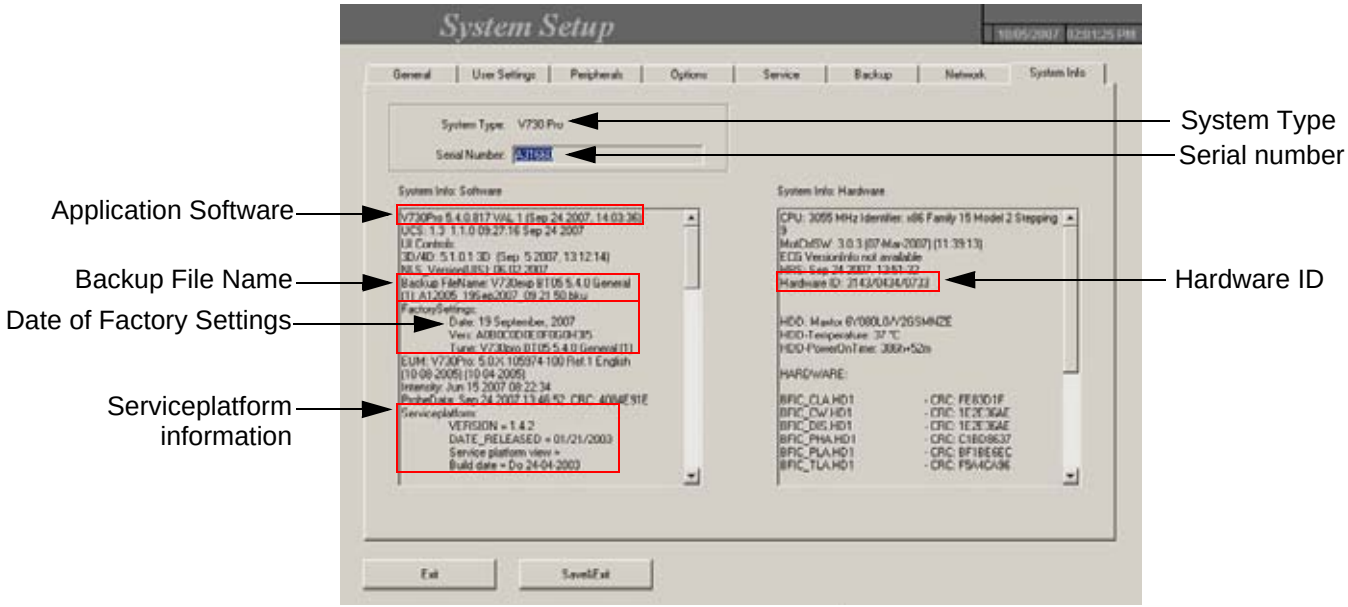
Section	Description	Page Number
7-1	Overview	7-1
7-2	Collect Vital System Information	7-2
7-3	Check Points Voltages	7-3
7-4	Screen Captures and Logs	7-4
7-5	How to use the Auto Tester program	7-7
7-6	Minimum Configuration to Scan	7-10
7-7	Troubleshooting Trees, Instructions and Tech Tips	7-12
7-8	Error Messages	7-21

Section 7-2
Collect Vital System Information

The following information is necessary in order to properly analyze data or images being reported as a malfunction or being returned to the manufacturer:

Press the **UTILITIES** key, select the SYSTEM item and then enter the SERVICE INFO page.

- **System Type**
- **System Serial number** (also visible on label on the back of the system)
- **Application Software version**
- **Backup Version** (File Name)
- **additional information** (e.g., Hardware ID, SLOT_CPU version, etc.)



Move the scroll bar downwards to review additional information about installed software/hardware.

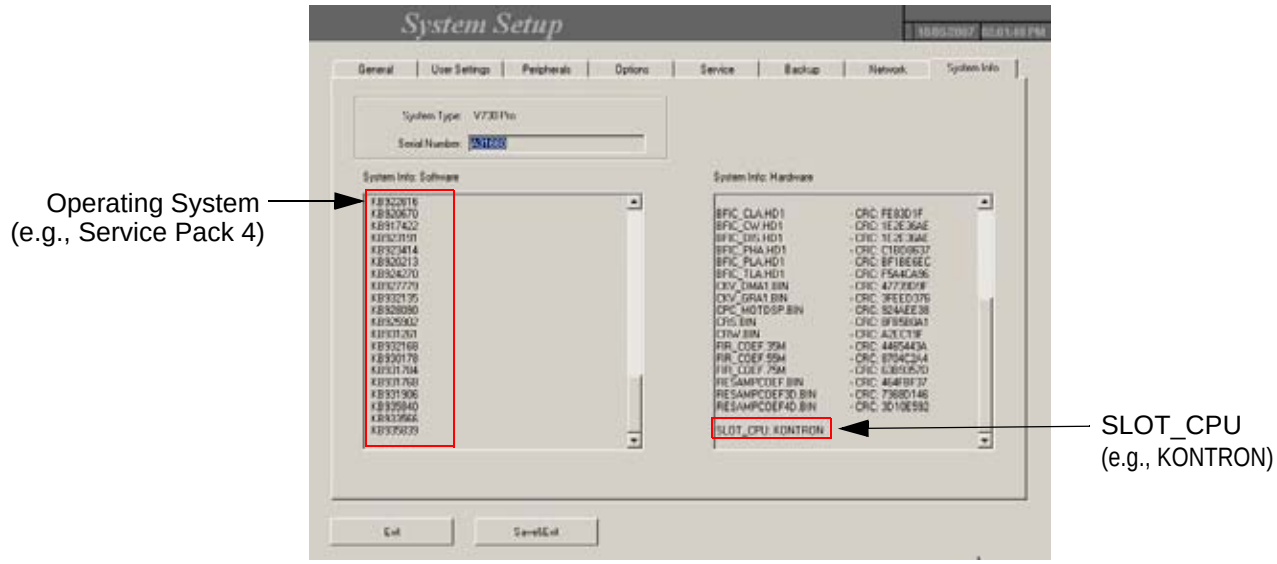
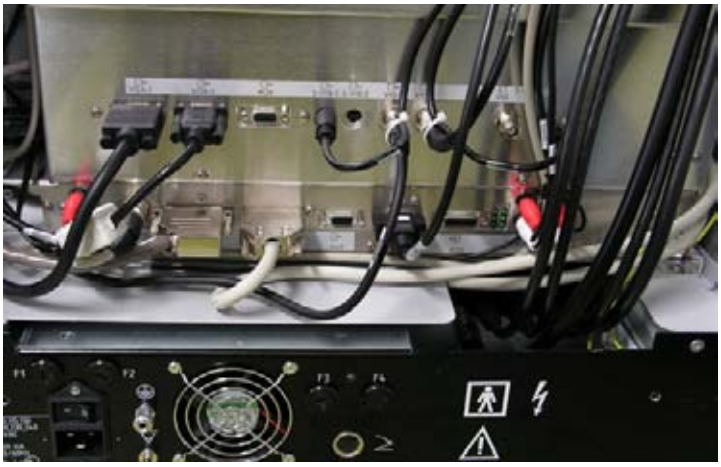


Figure 7-1 System Setup - System Info page (e.g. V730 Pro)

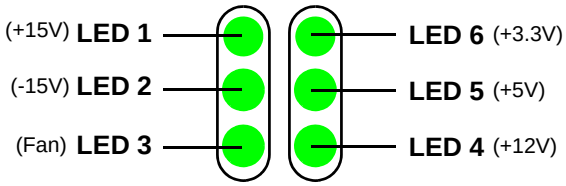
Section 7-3
Check Points Voltages

7-3-1 How to check power



Open the locking on the back of theVoluson® 730Pro/ProV and remove the service lid.

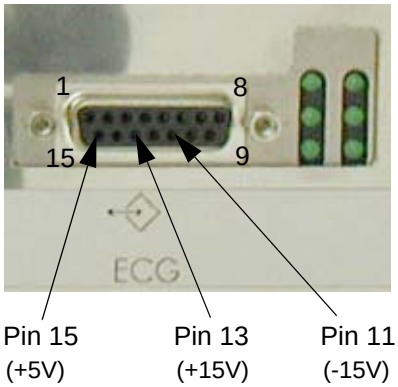
Check the status of the Diagnostic LED´s.



In case of problems, check the above voltages with a Digital Volt Meter (DVM) to Ground.

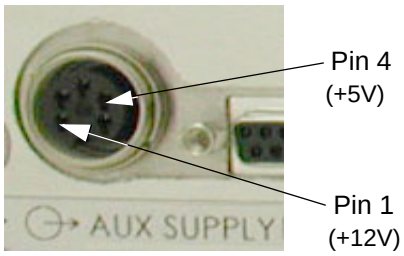
LED 1, 2 and 5

ECG connector
on Backpanel of GEZ-Box



LED 4

AUX Supply (= GEM Power connector)
on Backpanel of GEZ-Box



Location of fuses on CPE;
see: Section 5-11-2-1 on page 5-50

Additionally check 59V/DC
(Power connection-cable
from CPN to GEZ)

LED 6

Footswitch connector on Power Supply Module (CPN)
(Pin 2 and 3 = +3.3V ; Pin 1 = GND)

LED orange
visual check for 59V: orange LED
(at CPN power supply) is lightening

Figure 7-2 Diagnostic LED´s and corresponding voltage check points

Section 7-4
Screen Captures and Logs

There may be times when the customer or field engineer will want to capture a presentation on the screen so it may be recovered by the OnLine Center.

This is accomplished by saving the image(s):

A.) to SonoView and export them (as jpg, bmp or tiff) to DVD/CD+(R)W or MO-disk

B.) as jpg and bmp to D:\export by pressing the **ALT** + **P** key on the alphanumeric keyboard

C.) creates one snapshot (Alt-D.bmp) + “Full Backup” of the System state (fullbackup -> fb1) saved on D:\export by pressing the **ALT** + **D** key on the alpha-numeric keyboard.

7-4-1 Capturing a screen

The following is the generic process to capture any screen from the scanner.

1.) Navigate to and display the image/screen to be captured.

2.) Press the **SAVE 2D** key on the control panel and save the image to Sonoview.

3.) Select the stored image(s) in Sonoview (Exam List) and EXPORT the image(s) to DVD/CD+(R)W or MO-Disk (jpg, bmp or tiff).

7-4-2 Export Log’s and System Data

There are two possibilities to export system data (and log´s):

1.) by pressing the **ALT** + **D** key to save a snapshot and “Full Backup” of the System state;
see: Section 7-4-2-1 on page 7-5

2.) via the EXPORT SYSTEM DATA button in the System Setup **SERVICE** page;
see: Section 7-4-2-2 on page 7-6

7-4-2-1 Export System Data (by pressing the ALT + D key)

ALT + **D** uses “Full Backup” to gather data from the system. In addition it creates one screenshot (Alt-D.bmp) of the point in time when **ALT** + **D** was pressed.
The main use is when R&D or OLC need detailed information about the system (e.g., when experiencing strange behaviour or when the problem should be investigated by R&D).
It is **not** intended to replace or enhance the existing Full Backup functionality.

Data can be stored on the hard disk (D:\export\fullbackup\fb1), or you can export them to DVD/CD (including the D:\export folder, which contains logs and dump-files; for details see: Section 7-4-2-2-1).

*NOTE: Successive **ALT** + **D** keystrokes overwrite existing snapshots at destination HDD.*

1.) Press the **ALT** + **TAB** key on the keyboard. simultaneously.

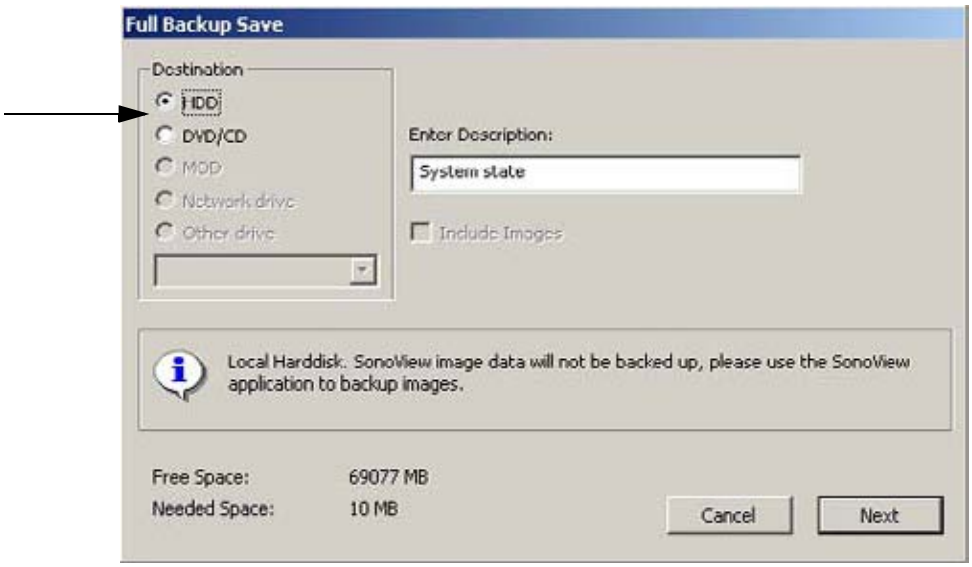


Figure 7-3 select destination for “System state” backup

2.) Select the destination of the “System state” backup among HDD or DVD/CD.
3.) Select the NEXT button to start the backup process.
After saving the data, the Voluson® 730Pro/ProV reboots and the application starts again.

7-4-2-2 Export Log´s and System Data (via Service Page)

1.) Press the **UTILITIES** key, select the SYSTEM item from the menu area.

2.) Select the SERVICE page on the screen. The “password window” appears automatically.

3.) Enter the password SHE and click the ACCEPT button to display the Service Tools window.

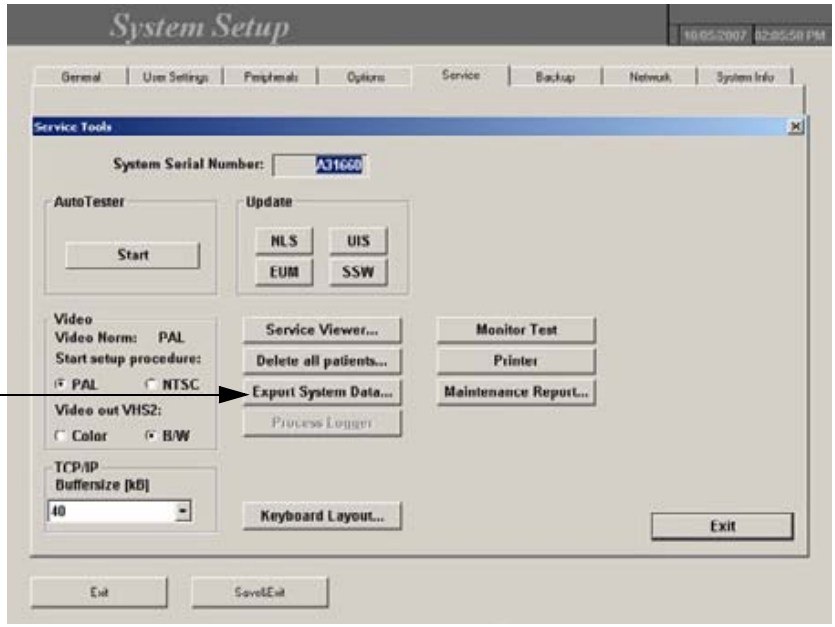


Figure 7-4 Service Tools window

4.) Click on the EXPORT SYSTEM DATA... button, to export dump-files (see: Section 7-4-2-2-1), text files, the Event Log File, the full Service Database and information about probes, boards, software, options and service actions to DVD/CD Drive (or the optional MO drive).

7-4-2-2-1 Dump-file

Every time an error message like Figure 7-5 is produced, a dump-file and a text file containing the error dump and the error message are created in D:\export. Up to 20 dump files are stored there.

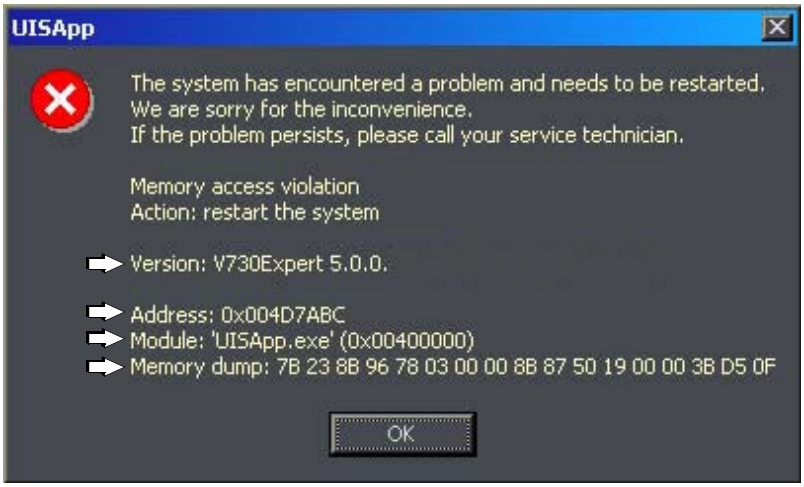

UISApp
The system has encountered a problem and needs to be restarted.
We are sorry for the inconvenience.
If the problem persists, please call your service technician.
Memory access violation
Action: restart the system
Version: V730Expert 5.0.0.
Address: 0x004D7ABC
Module: 'UISApp.exe' (0x00400000)
Memory dump: 7B 23 8B 96 78 03 00 00 8B 87 50 19 00 00 3B D5 0F
OK
important dump-file informations

Figure 7-5 system has encountered a problem

After clicking on OK the system reboots automatically.

Section 7-5
How to use the Auto Tester program

NOTE: Startup the system. Before starting an exam Auto Tester must be turned on.
Immediately after occurrence of the issue you need to stop the Auto Tester and save the results!
In case of a system shut down, the Auto Tester stops automatically and the results will not be saved!

1.) Press the **UTILITIES** key, and then select SYSTEM from the menu area.
2.) Select the SERVICE page on the screen. The “password window” appears automatically.
3.) Enter the password SHE and click the ACCEPT button to display the Service Tools window.

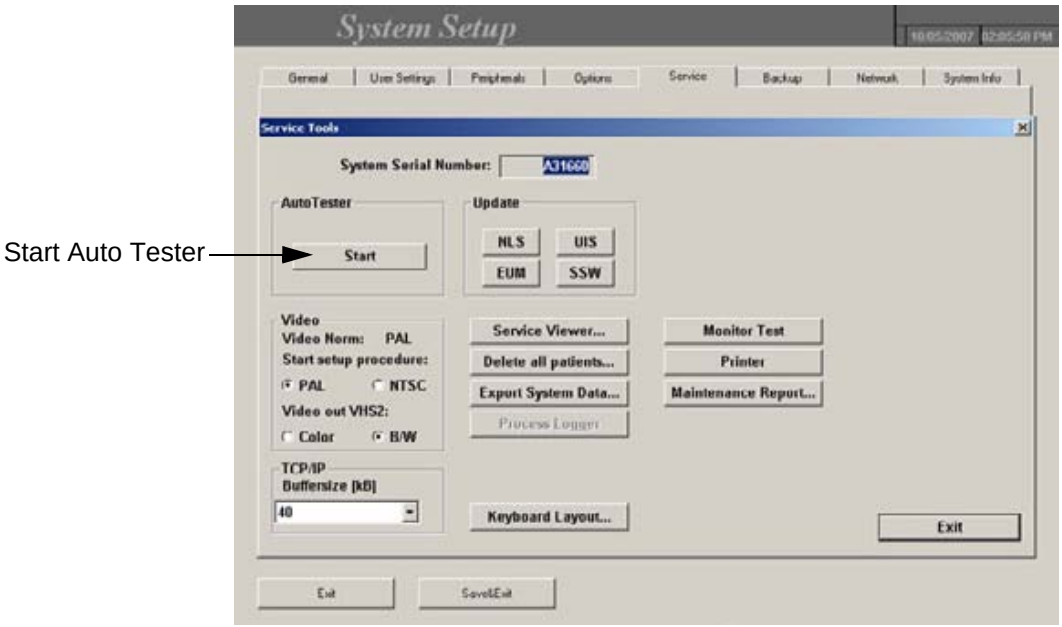


Figure 7-6 Service Tools window

4.) Activate the “Auto Tester” program by clicking the START button.
The following message box appears.

UltraSound
Test recorder will be started now.
1) To activate AutoTester, press ALT-GR key on the keyboard.
2) To start recording, press red RECORD button on the toolbar.
3) To stop recording, press ALT-GR key on the keyboard.
Please call technical support for using.
OK
Cancel
Alt Gr
Alt Gr
key on the
right lower corner
of the keyboard

Figure 7-7 Message Box

5.) Click OK.
6.) Press the **ALT GR** key on the alphanumeric keyboard.

Section 7-5 How to use the Auto Tester program (cont'd)

7.) Activate the "Auto Tester" program by clicking the "Record" icon on the displayed screen.

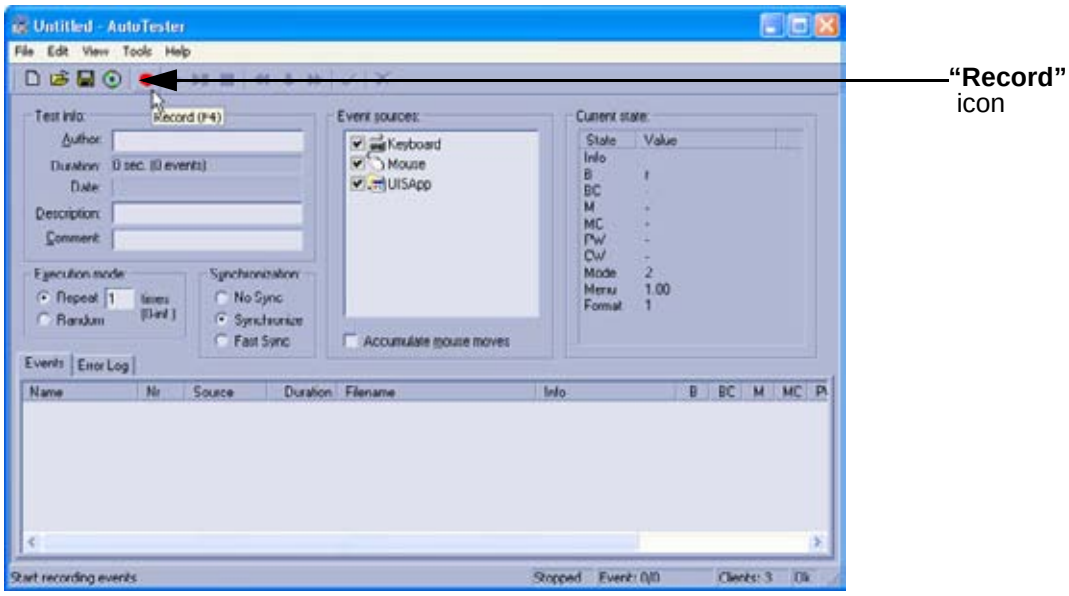
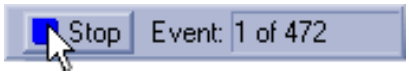


Figure 7-8 Start Auto Tester

8.) Start scanning.
You can scan normally and everything will be recorded to the program (up to several hours.)

NOTE: It is important that you are recording the processes where the errors normally occur.



Stop the program by clicking on [**Stop**] shown on the screen, or by pressing the [**ALT GR**] key on the alphanumeric keyboard.

Figure 7-9 Stop Autotester

The following screen will appear.

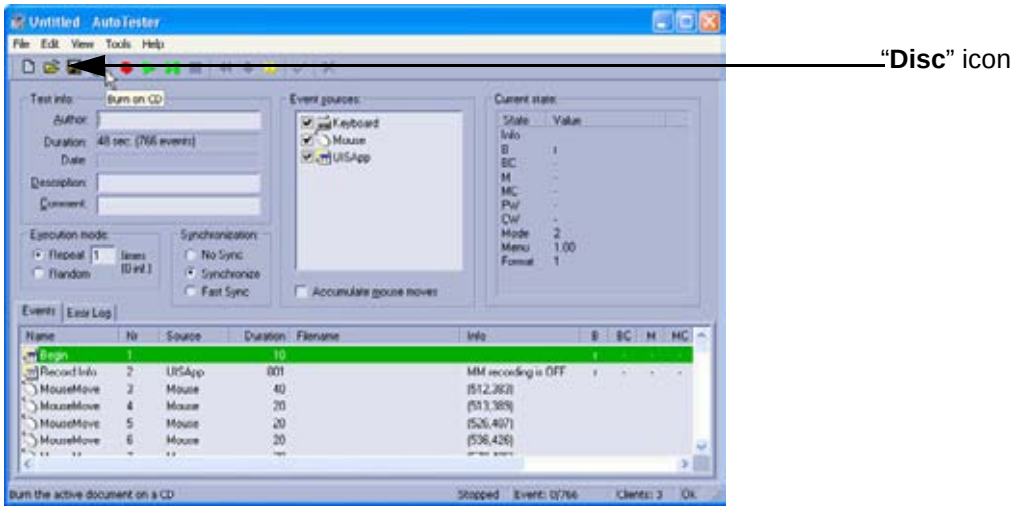


Figure 7-10 Auto Tester Finished

Section 7-5 How to use the Auto Tester program (cont'd)

9.) Maybe have it read to save the file, press the "Disc" icon, the following screen will appear:

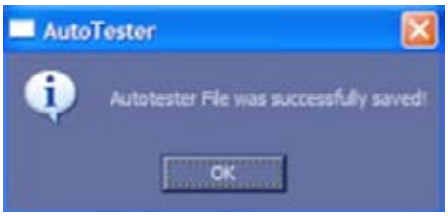


Figure 7-11 Auto Tester

10.) The file will be saved in D:\Export\AutotesterScripts*.*.

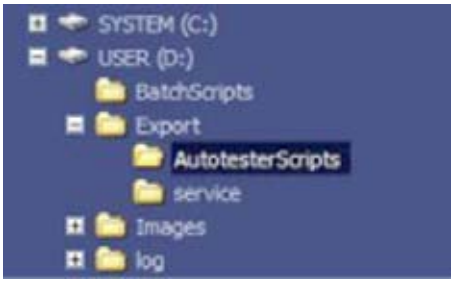


Figure 7-12 Enter a Filename

11.) **ALT** + **D** contains the needed logs.

NOTE: To analyze the workflow the exact date and time of occurrence needs to be documented!

7-5-1 Limitation of the Auto Tester

The following infomation will not be recorded, depending on the moment the Auto Tester is activated so this must be provided by the customer of the FSE:

- Which probe is in use and which probes are connected?
- Which Mode is activated?
- Which peripherals are connected (Dicom, Printer, etc..)?

NOTE: The standalone recorded "Auto Tester" file makes only sense with the **ALT** + **D** *Log!*

Collected information from all steps above can be sent to the Make Center. With this infomation the Make Center can see how the customer is using the system and reproduce potential failures.

Providing all information at once will help the Make Center find the root cause and speeds up finding a solution for the customer.

Section 7-6
Minimum Configuration to Scan

Following cables must be connected to scan; see: Figure 7-13 and/or Figure 7-14

a.) PS2 (connector for Mouse/Keyboard)
b.) UI Disp. (connector for User Interface Display) - **NOT used** at Voluson® 730Pro/ProV
c.) DVI (Digital Video Cable from ADD-On DVI Output to CKV-board)
d.) VGA (Monitor)
e.) Console
f.) CPN (Primary Power Supply)
g.) Standby switch
h.) Monitor (Power Supply)

*** RS-232 Serial Interface for Console (GEU)

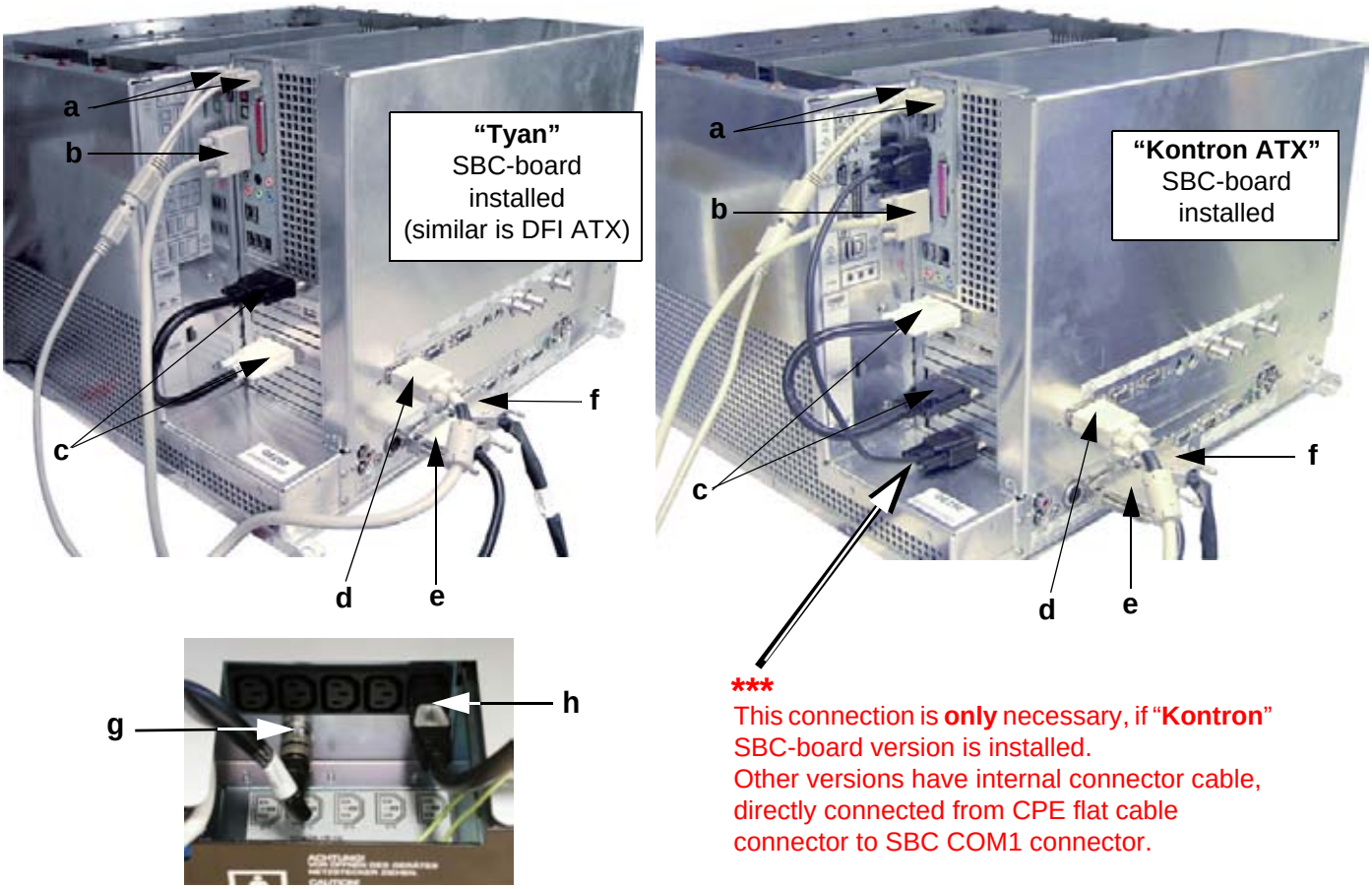


Figure 7-13 cable- minimum configuration Tyan and Kontron ATX

Section 7-6 Minimum Configuration to Scan (cont'd)

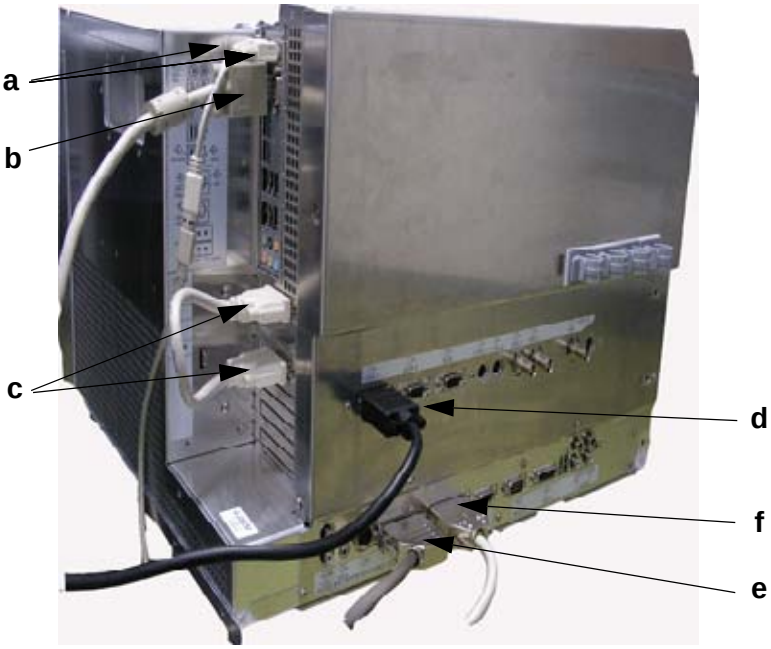


Figure 7-14 cable- minimum configuration Kontron Flex

Connect mains power cable to the system and to an appropriate mains power outlet.

Connect a probe, boot up the system and start an User program.

Section 7-7
Troubleshooting Trees, Instructions and Tech Tips

7-7-1 System Does Not Power On / Boot Up

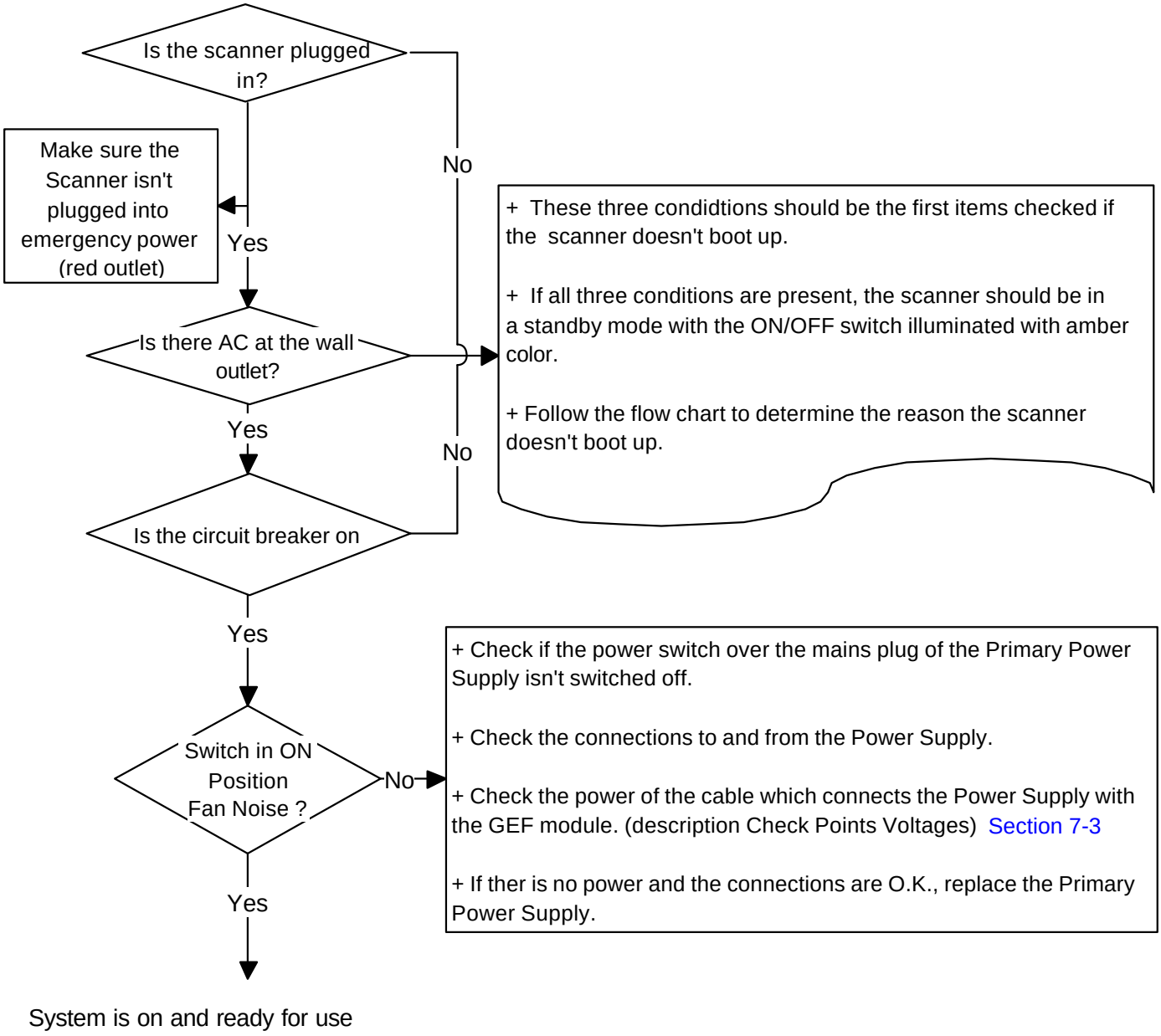

Is the scanner plugged in?
No
Make sure the Scanner isn't plugged into emergency power (red outlet)
Yes
+ These three condidtions should be the first items checked if the scanner doesn't boot up.
+ If all three conditions are present, the scanner should be in a standby mode with the ON/OFF switch illuminated with amber color.
+ Follow the flow chart to determine the reason the scanner doesn't boot up.
Is there AC at the wall outlet?
Yes
No
Is the circuit breaker on
Yes
+ Check if the power switch over the mains plug of the Primary Power Supply isn't switched off.
+ Check the connections to and from the Power Supply.
+ Check the power of the cable which connects the Power Supply with the GEF module. (description Check Points Voltages) Section 7-3
+ If ther is no power and the connections are O.K., replace the Primary Power Supply.
Switch in ON Position Fan Noise ?
No
Yes
System is on and ready for use

Figure 7-15 System does not boot up

7-7-2 Noise disturbs the Image

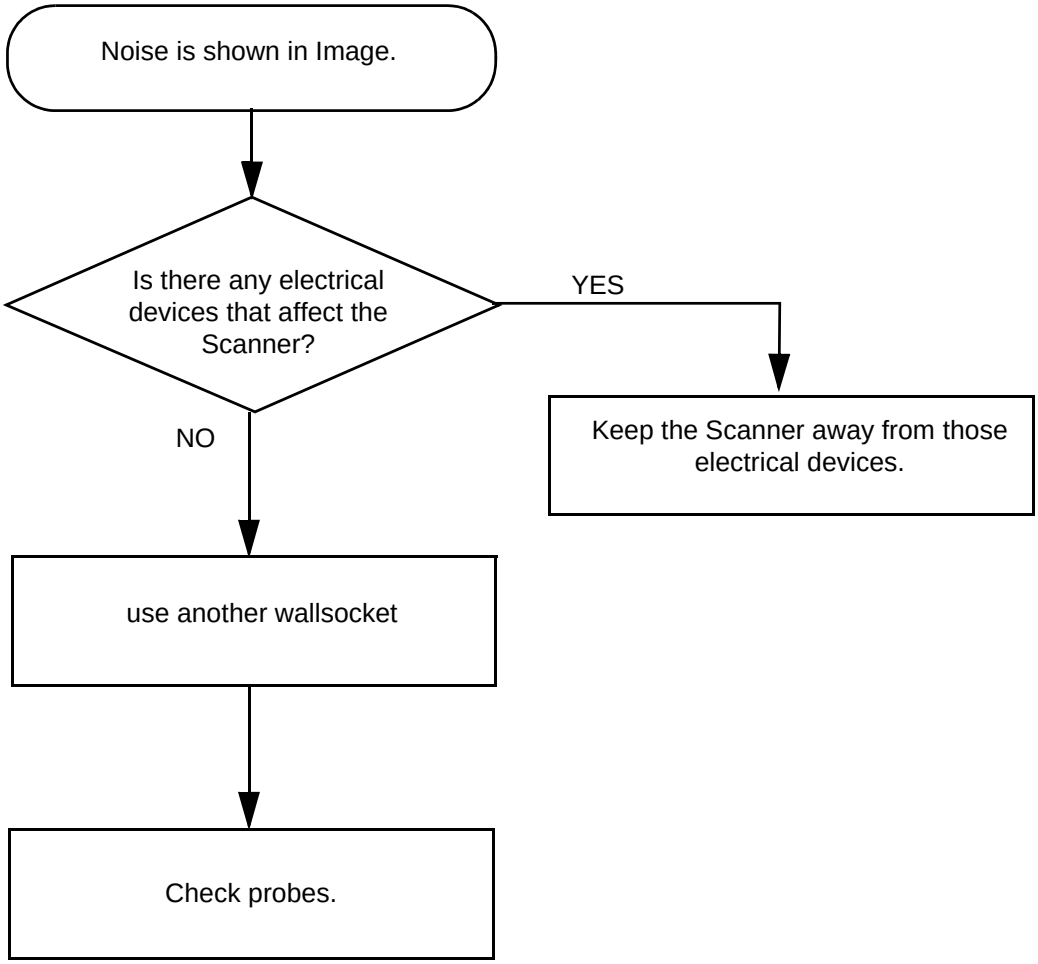

Noise is shown in Image.
Is there any electrical devices that affect the Scanner?
YES
Keep the Scanner away from those electrical devices.
NO
use another wallsocket
Check probes.

Figure 7-16 Noise disturbs the Image - Troubleshooting

7-7-3 Trackball

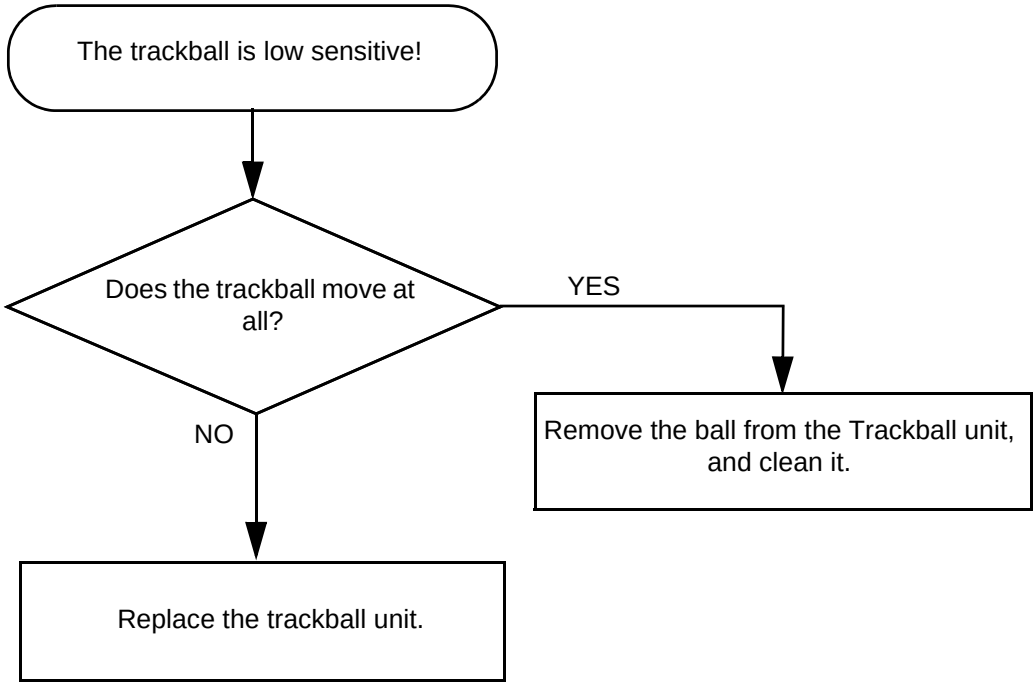

The trackball is low sensitive!
Does the trackball move at all?
YES
NO
Remove the ball from the Trackball unit, and clean it.
Replace the trackball unit.

Figure 7-17 Trackball - Troubleshooting

7-7-4 System Does Not Power Off / Shutdown

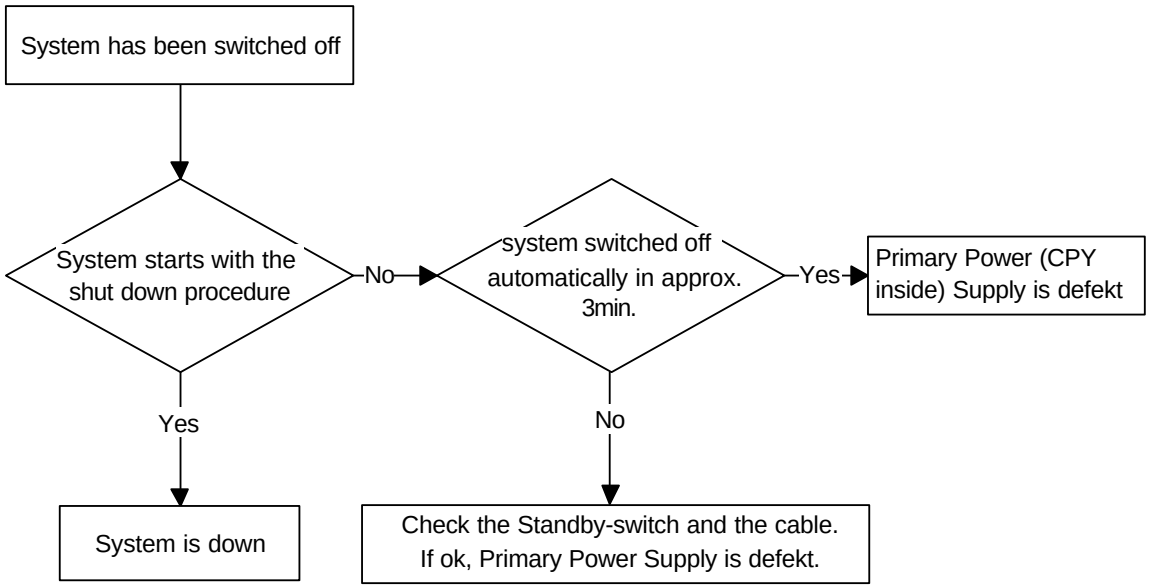

System has been switched off
System starts with the shut down procedure
No
system switched off automatically in approx. 3min.
Yes
Primary Power (CPY inside) Supply is defekt
Yes
No
System is down
Check the Standby-switch and the cable.
If ok, Primary Power Supply is defekt.

Figure 7-18 Power Off / Shutdown - Troubleshooting

7-7-5 Monitor Troubleshooting

Fault symptom	Check these items
No image	Check the power cord is properly connected.
	CPN: Check the AC output voltage fused by F3 on back of system.
	Check the video cable is properly connected.
	Check no pins of the video cable are bent.
	Check if video is present on backplane.
Color is not uniform	Turn ON the power to activate the Auto-Degauss function.
Colored streaks appear in image	Check for presence of magnetic sources near the monitor. Eliminate the sources and then degauss the monitor.
Screen image is not centered or sized properly	Adjust the picture location, picture size, picture rotation or pincushion distortion.
	Some video modes do not fill the screen to the edge of the monitor. There is no single answer to solve the problem. This phenomenon may occur on higher refresh rates (vertical frequency).
Picture is fuzzy	Adjust the picture contrast and picture brightness. Some SVGA cards having an excessive video output level will cause a fuzzy picture at the maximum contrast level.
	Turn ON the power to activate the Auto-Degauss function.
Video test patterns are not clear, bright, parallel or square	Replace the monitor.

NOTICE The monitor should automatically degauss itself each time power is applied if you wait at least 10 seconds before you turn power back ON.

For further details refer to Section 6-3 "Monitor Adjustment" on page 6-2.

7-7-6 Unable to Record to VCR

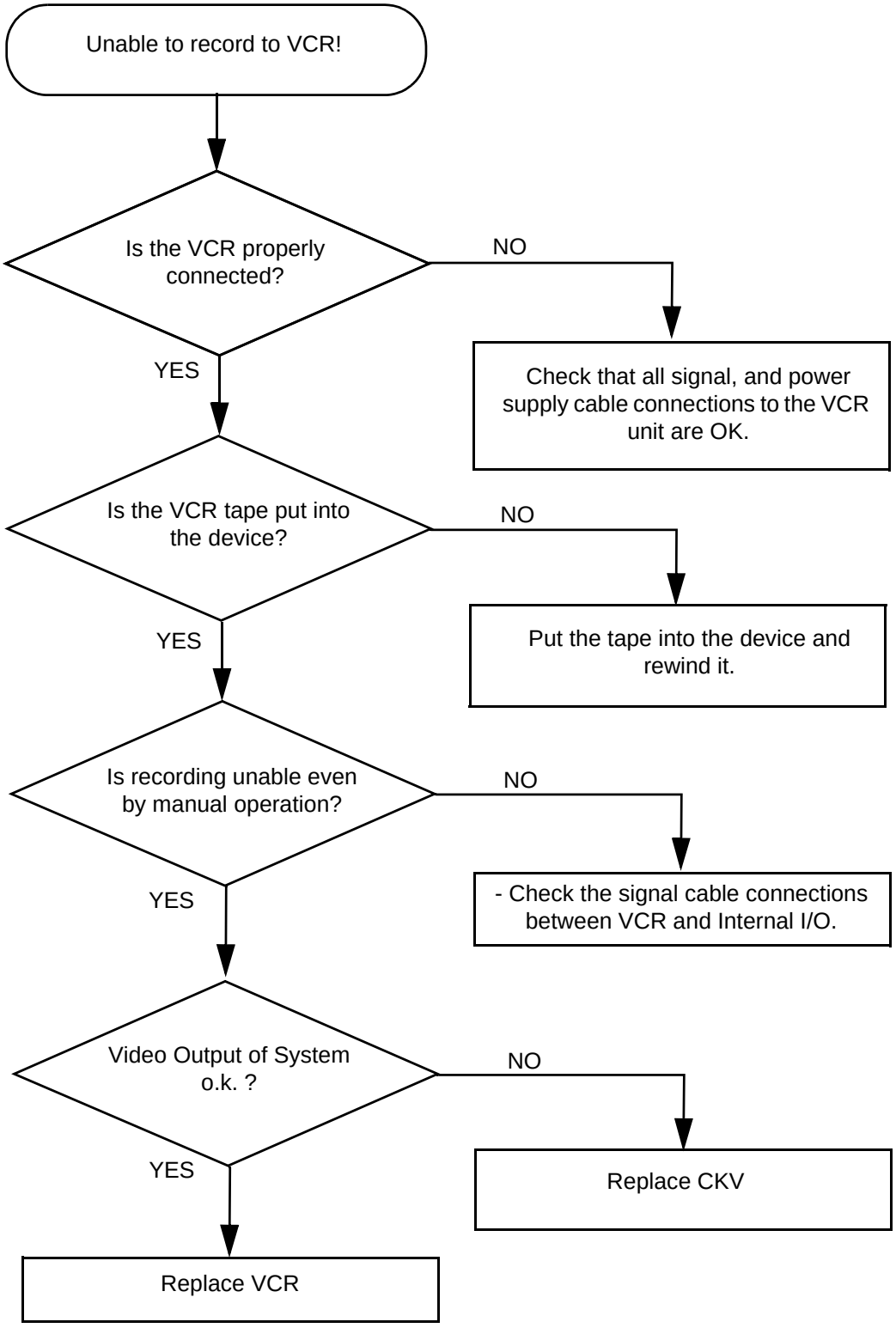

Unable to record to VCR!
Is the VCR properly connected?
NO
Check that all signal, and power supply cable connections to the VCR unit are OK.
YES
Is the VCR tape put into the device?
NO
Put the tape into the device and rewind it.
YES
Is recording unable even by manual operation?
NO
- Check the signal cable connections between VCR and Internal I/O.
YES
Video Output of System o.k. ?
NO
Replace CKV
YES
Replace VCR

Figure 7-19 VCR - Troubleshooting

7-7-7 Printer Troubleshooting

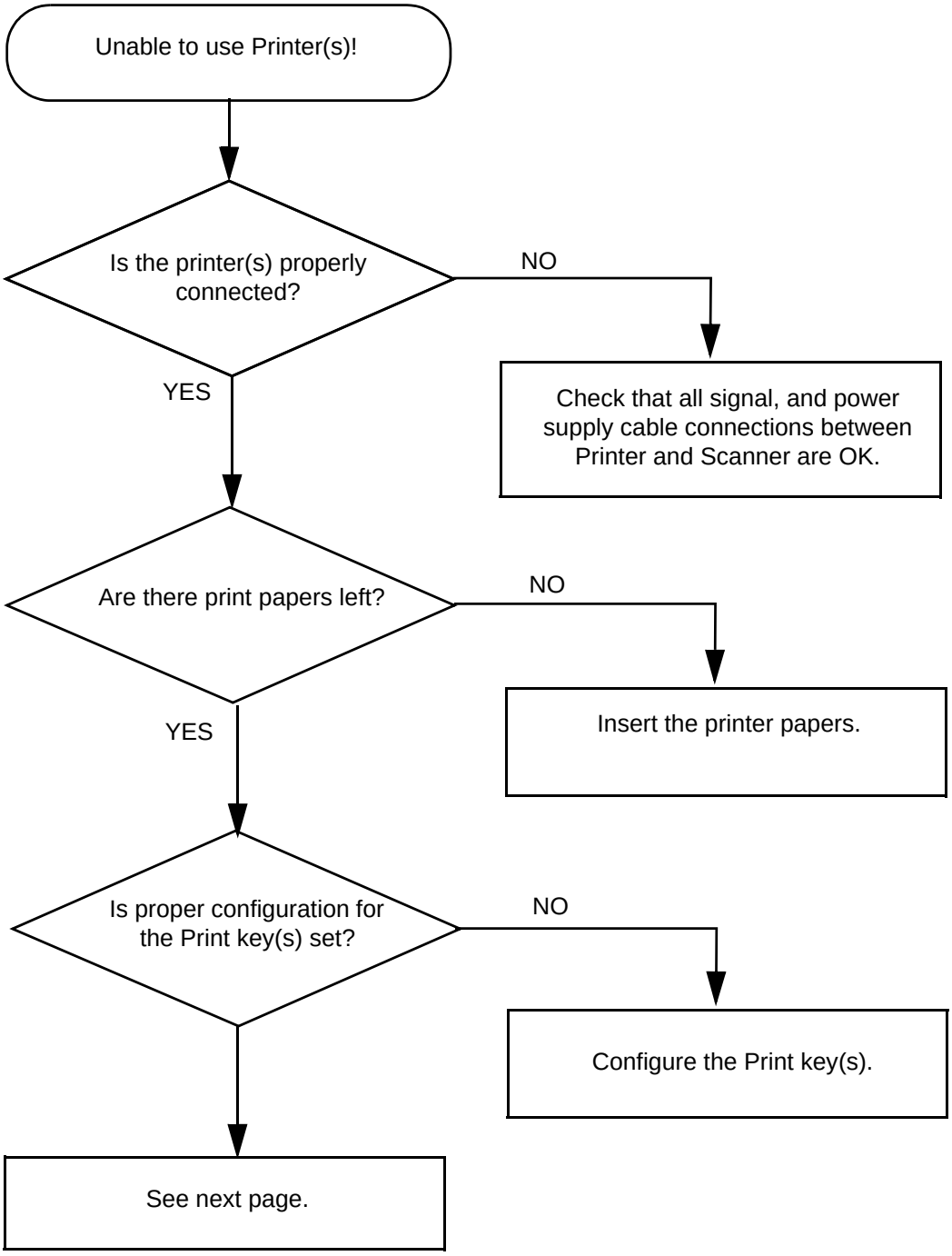

Unable to use Printer(s)!
Is the printer(s) properly connected?
NO
Check that all signal, and power supply cable connections between Printer and Scanner are OK.
YES
Are there print papers left?
NO
Insert the printer papers.
YES
Is proper configuration for the Print key(s) set?
NO
Configure the Print key(s).
See next page.

Figure 7-20 Printer - Troubleshooting

7-7-7 Printer Troubleshooting (cont'd)

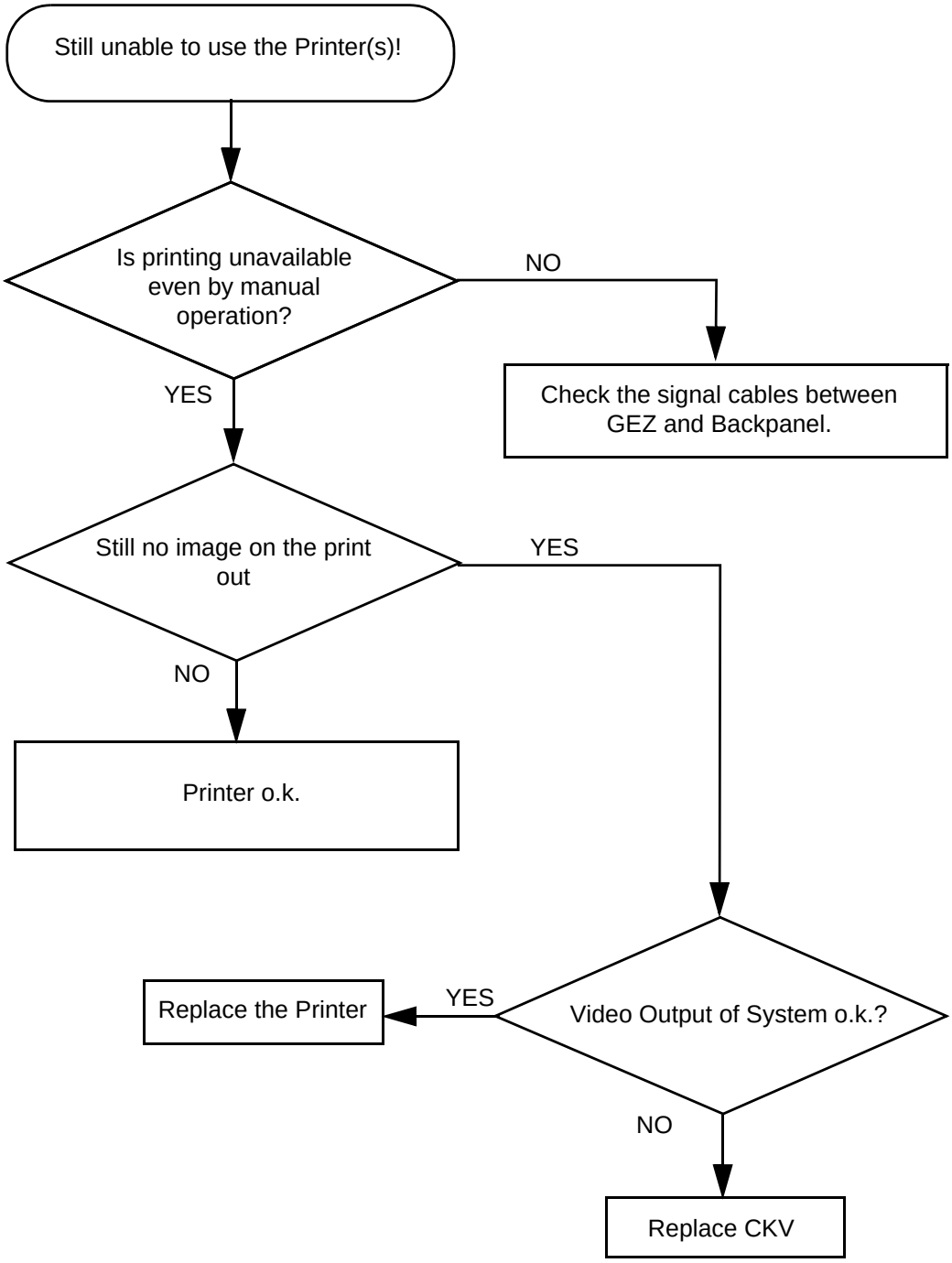


Figure 7-21 Printer Troubleshooting (cont'd)

7-7-8 DVD/CD-(R)W Troubleshooting (DVD/CD Drive)

1.) Insert an empty DVD/CD-(R)W into the Drive.
2.) Enter “Sonoview” by pressing the **SONOVIEW** key on the control panel; see Figure 7-22.
3.) Click the “Open” icon to display the list of exams.
4.) Select exam(s) and backup them to DVD/CD-(R)W.
5.) Choose “DVD/CD” Drive.
6.) The images, which you have choosen during backup should be visible.

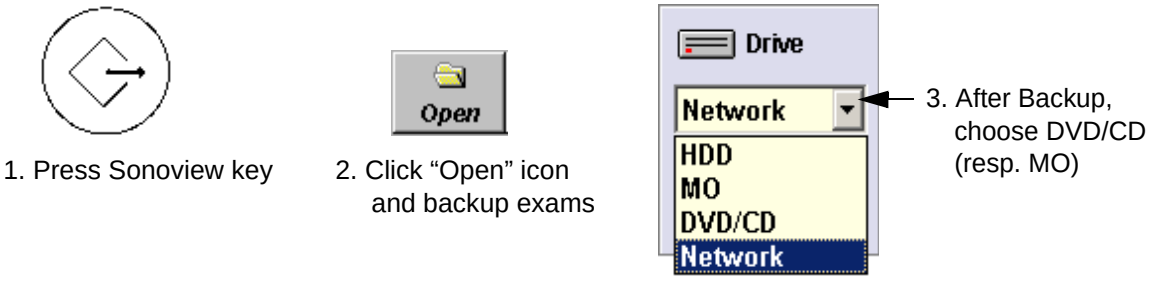


Figure 7-22 To backup exams to DVD/CD+(R)W resp. MO-Disk

NOTICE In case of any problems, check status of the Diagnostic LED´s and voltages of the AUX Supply connector (= Disk Drive Module power connector) on the backpanel of the GEZ-Box;
see: Section 7-3 "Check Points Voltages" on page 7-3

7-7-9 MOD Troubleshooting

1.) Insert an empty MO into the Drive.
2.) Enter “Sonoview” by pressing the **SONOVIEW** key on the control panel; see Figure 7-22.
3.) Click the “Open” icon to display the list of exams.
4.) Select exam(s) and backup them to MO.
5.) Choose “MO” Drive.
6.) The images, which you have chosen during backup should be visible.

NOTICE In case of any problems, check status of the Diagnostic LED´s and voltages of the AUX Supply connector (= Disk Drive Module power connector) on the backpanel of the GEZ-Box;
see: Section 7-3 "Check Points Voltages" on page 7-3

7-7-10 Network Troubleshooting

7-7-10-1 No Connection to the Network at All

1.) Check that the network cable between the scanner and the wall network is connected and well seated in both ends. (Use a network cable that is known to be OK.)
2.) Check the cable from network-connector on the Back Panel to the LAN-connector on the GEZ.
3.) Connect a network cable between your Scanner and your PC. Try to ping from the Scanner to the IP address on the PC. If OK, the hardware connection inside the Scanner is OK.

Section 7-8
Error Messages

NOTICE If the problem (error message) still exists after performing the described actions, call technical support.

Error Messages	Actions
3D B_RxLines exceeded!	restart the system
3D B-O_Frames exceeded!	restart the system
3D C_RxLines exceeded!	restart the system
3D C-O_Frames exceeded!	restart the system
530-Probe connected on…….	Disconnect and reconnect the probe. If error remains don't use such a probe.
AcousticUnitType not supported by BF_Interface:	restart the system
Array bounds exceeded	restart the system
Attempt to read Probe-ID from an invalid probe connector.	reboot system.
AVI Save function fails	check cable connections - restart the system and try again
B_Enhance Out Of Range	press ok and save this user-setting once again
B_Gain Out Of Range	press ok and save this user-setting once again
B_Reject Out Of Range	press ok and save this user-setting once again
B_TxFocus - not calculated and B_SHOT_PART_ON	restart the system
Backup error while writing. (Error during writing of backup data.)	check storage destination for Full Backup (e.g., DVD/CD not empty, insufficient rights on target Network drive, write protection on MO or USB-drive)
Backup error while verifying. (Checksum mismatch)	repeat backup
BC Ensemble Out Of Range	press ok and save this user-setting once again
BC lines_per_sequenz < 1	restart the system
BC lines_per_sequenz < 2	restart the system
BC_Dynamic Out Of Range	press ok and save this user-setting once again
BC_Gain Out Of Range	press ok and save this user-setting once again
BC_Lines: BC_LineDensity out of limit	restart the system
BCMC_Balance Out Of Range	press ok and save this user-setting once again
bCP_ConvertParameters failed	restart the system
bCP_ProcessIQEnsemblePacket failed	restart the system
bCP_ProcessIQMModePacket failed	restart the system

Error Messages	Actions
B-DynContrast Out Of Range	press ok and save this user-setting once again
BF: can't set BM RxApod	restart the system
BF: can´t set C Rx Apod	restart the system
BF: can't set D RxApod	restart the system
binary file not found	restart the system
Binary path not set	restart the system
BM_Resample: overrun SampleLengthOnLineMem	restart the system
Cannot create instance	restart the system
Cannot read a valid Probe-ID (xxx) from…….	disconnect and reconnect the probe
Cannot import volume data to 3D dll	load volume files from other storage medium
Can't create hardware configuration index file in D:\\SERVICE	restart the system
Can't detect PCI 9054	restart the system
Can't import session	use a new CDR to write data to CD
Can't open file: ……	restart the system
can't open MotCtrl RS232 Serial connection	restart the system
Can't open:	restart the system
Can't open: C:\V730\Distribution\Hardware\patterndat.bin	restart the system
can't write XilinxFiles.ini	restart the system
CD write error	use a new CDR
Cine2D_CtrlBlock::vSetState: value of m_GIP_eCineType undefined!!	restart the system
Cine2D_CtrlBlock::vSetState: value of m_pGIP_eR_W_Mode undefined!!	restart the system
Communication thread is dead!	restart the system
ConManager - RC_ConstructGOPs: Memory allocation failed	restart the system
CPF Hardware not found	restart the system
CPS_InterfaceToHW::vSet_VOL_MODE -- incorrect value for ColorDMA_Active	restart the system
CPS_InterfaceToHW::vSet_VOL_MODE -- incorrect value for EndOfFrameInt	restart the system
CPS_InterfaceToHW::vSet_VOL_MODE -- incorrect value for LongLineMemFIFO	restart the system
CPS_InterfaceToHW::vSet_VOL_MODE -- incorrect value for Mode_4D	restart the system

Error Messages	Actions
CtrlMvGrpRepresentations::isInWriteMode not supported for mode nr xx	restart the system
CW quant TX Frequ out of range	restart the system
CW_BaseLinePos Out Of Range	press ok and save this user-setting once again
CW_Gain Out Of Range	press ok and save this user-setting once again
CW-hardware doesn't support	pencil probe + CW-Hardware not available->HW problem
CW-HW-PRF == 0	restart the system
CW-TxFrequency == 0	restart the system
CW-TxPower Out Of Range	press ok and save this user-setting once again
D:\\SERVICE\\ConfIndexFile is corrupt	restart the system
Datatype misalignment	restart the system
Delete error (Backup data could not be deleted.)	check storage destination of Full Backup (e.g., DVD/CD, insufficient rights on target Network drive, write protection on MO or USB-drive)
Density Out Of Range	press ok and save this user-setting once again
Different software error (Backup data was made on another system with a different software version.)	This backup cannot be restored by the user.
Disc full!	use a new CDR for writing data to CD
Display:Rect Region fails	restart the system
Division by zero	restart the system
done is low!	restart the system
Downgrade error (Backup data was made with a software version higher than the installed version.)	load appropriate backup for installed version
DSP - Gamma Corr - Load Data Timeout	restart the system
DSP - HilbertCoeff - Load Data Timeout	restart the system
DSP - Low Pass Coeff - Load Data Timeout	restart the system
DSP - SetFFT_Para - Load Data Timeout	restart the system
DSP - SetWMF_Koeff - Load Data Timeout	restart the system
DSP/MSE:Hanning-Window Load Data Timeout	restart the system
ECG_InterfaceToHW::vLookupForNewSamples() allocating expanded buffer[xxx] for TimeStamps failed!!	restart the system
Electronic user manual not installed. Please install.	install Electronic User Manual (EUM) and try it again
End Bandwidth too big	restart the system
End ET too big	restart the system
End frequency too big	restart the system

Error Messages	Actions
Enhance Out Of Range	press ok and save this user-setting once again
Ensemble Out Of Range	press ok and save this user-setting once again
Error in CreateCineImage	try to store again; restart the system
Error in File: ….	restart the system
Error in Select Tx-channel for B-mode	restart the system
Error in Select Tx-channel for C-mode	restart the system
Error in Select Tx-channel for CW-mode	restart the system
Error in Select Tx-channel for PW-mode	restart the system
Error no HW present	restart the system
Error not enough time for BC shot!	restart the system
Error on LoadBootMem Page: xx, Addr: xx	restart the system
Error programming Flashcomplette	restart the system
Error setting state	restart the system
ERROR_MSG_INIT_FAILED	Check connection from US machine to VCR, VCR has power and is on.
ERROR_MSG_NO_ACK	check VCR cables and try again
ERROR_MSG_NO_CASSETTE	put cassette into drive of VCR
ERROR_MSG_NO_RESPONSE	check VCR cables, casette,... and try again
ERROR_MSG_WRITE_PROTECTED	remove cassette from VCR and put writeable cassette into drive of VCR.
Execute privileged instruction	restart the system
FallSmooth Out Of Range	press ok and save this user-setting once again
File Could not CRC Check	load volume files from other storage medium
File CRC Error	load volume files from other storage medium
File CRC Missing	load volume files from other storage medium
File Data Missing	load volume files from other storage medium
File Datalength Not Consistent	load volume files from other storage medium
File Decompress Error	load volume files from other storage medium
File Decompress method Unknown	load volume files from other storage medium
File End Error	load volume files from other storage medium
File Execute Error	load volume files from other storage medium
File Memory Missing	load volume files from other storage medium
File Not Found	load volume files from other storage medium

Error Messages	Actions
File Pos	load volume files from other storage medium
File Read Error	load volume files from other storage medium
File Type Unknown	load volume files from other storage medium
File Volume size not consistent	load volume files from other storage medium
FLT: Denormal operand	restart the system
FLT: Divide by zero	restart the system
FLT: Invalid operation	restart the system
FLT: Stack overflow	restart the system
FLT: Underflow	restart the system
FrameUp - TempBuffer: Memory allocation failed	restart the system
GeoDescription3D_TissueCF::operator=: handed over argument is not of same type, dynamic cast failed!!	restart the system
GeoDescriptionMotion Constructor: unknown mode Parameter handed over	restart the system
GeoDescriptionMotion::operator=: handed over argument is not of same type, dynamic cast failed!!	restart the system
GeoDescriptionPWMode::operator=: handed over argument is not of same type, dynamic cast failed!!	restart the system
GeoDescriptionTissueCF Constructor: unknown mode Parameter handed over	restart the system
GeoDescriptionTissueCF::operator=: handed over argument is not of same type, dynamic cast failed!!	restart the system
Hardware doesn't support CW-mode	pencil probe + CW-Hardware not available->HW problem
hardware error on	restart the system
HardwareRelatedSoftware_Windows in write have different ProbeAcousticUnitIDs	disconnect all connected probes and connect them again; if not ok restart the system
HardwareRelatedSoftware_Windows in write have different ProbeScanFuncIDs	disconnect all connected probes and connect them again; if not ok restart the system
IBegrenzer.cpp Bshots TxMultiFocus problem	restart the system
IBegrenzer.cpp Mshots TxMultiFocus problem	restart the system
In the 3D Image Measure is not allowed	change to another format than 3D Fullscreen mode
incorrect VersionByte, xx of xx cycles OK	contact technical support
iSetVideoSource(eVideoIntern) function fails	reboot the system
iSetVideoSource(eVideoIntern) function fails	the system will restart itself by pressing OK
LineFilt Out Of Range	press ok and save this user-setting once again
LP_KoefBlock: SamplePRF too big	restart the system

Error Messages	Actions
M_Gain Out Of Range	press ok and save this user-setting once again
M_Reject Out Of Range	press ok and save this user-setting once again
MC Ensemble Out Of Range	press ok and save this user-setting once again
MC_Balance Out Of Range	press ok and save this user-setting once again
MC_BaseLinePos Out Of Range	press ok and save this user-setting once again
MC_Dynamic Out Of Range	press ok and save this user-setting once again
MC_FallSmooth Out Of Range	press ok and save this user-setting once again
MC_Gain Out Of Range	press ok and save this user-setting once again
MC_RiseSmooth Out Of Range	press ok and save this user-setting once again
M-DynContrast Out Of Range+	press ok and save this user-setting once again
Memory access violation	restart the system
memory allocation error	restart the system
missing BCMCPW_TxFocusData	restart the system
missing BM_TxFocusData	restart the system
missing CW_TxFocusData	restart the system
missing ProbeAcousticUnit, wrong ProbeAcousticUnitID.	restart the system
missing ProbeGeneral data - wrong ProbeID	restart the system
missing ProbeScanFunc - wrong ProbeScanFuncID	restart the system
MotCtrl RS232 communication timeout	restart the system
MotCtrl: No Referenzposition signal!	Confirm the message by pressing the OK button, disconnect and reconnect the active probe and use it again. If the message appears again, usually the probe itself has an defect, so you should contact the service
MotionColor-DSC 1st:Memory allocation failed	restart the system
MotionColor-DSC 2nd:Memory allocation failed	restart the system
Motion-DSC:Memory allocation failed	restart the system
MoveVolumeAxis only supported by RealTime-probes !	look into the System Setup to see the current MotCtrl version and contact technical support
MoveVolumeAxis only supported by RealTime-probes (RRE)	look into the System Setup to see the current MotCtrl version and contact technical support
No CD Writer found	check the connection and the Power cable - plug the cable off and on and try again. (restart the system)
No disc in drive	insert disk, if fails again reboot and try again (with another disk)
Not enough space. (Not enough space on destination to hold the backup data.)	select another destination to save Full Backup

Error Messages	Actions
Overflow	restart the system
Persistance Out Of Range	press ok and save this user-setting once again
Persistence coeff page index too big	restart the system
pGetActualUnitBuffer failed, RepresentationManager is not initialized	restart the system
pGetActualUnitBuffer failed, RepresentationManager is not initialized	restart the system
Please plug off and on probe and try again	plug of and on the probe and try again, plug it on a different probe connector.
PlxMemCheck ERROR	restart the system
pNextUnitCompleted failed, RepresentationManager is not initialized	restart the system
PRF_GeneratorBoundary: BBC Ensemble Limitation out of limit	restart the system
PRF_GeneratorBoundary: BBCPW Ensemble Limitation out of limit	restart the system
Probe Scan Function Not Supplied	restart the system
PW_BaseLinePos Out Of Range	press ok and save this user-setting once again
PW_BurstCalcBlock: UserProgApplication out of range	restart the system
PW_CW_FFT_FactBlock: DSC_ScrollX_Zoom darf nicht kleiner als eins sein!	restart the system
PW_Dynamic Out Of Range	press ok and save this user-setting once again
PW_Reject Out Of Range	press ok and save this user-setting once again
PWCW-DSC:Memory allocation failed	restart the system
PWGain Out Of Range	press ok and save this user-setting once again
ReplayCtrlInterface::vReconnect failed, selected movie group unknown	restart the system
ReplayCtrlInterface::vRunAcquisition failed, selected movie group unknown	restart the system
ReplayCtrlInterface::vSetForAllRepMngrsParams failed, selected movie group unknown	restart the system
RepresentationManager returned NULL write position	restart the system
RepresentationManager: NextChunkGenerated failed, number bytes written!=UnitSize	restart the system
RepresentationManager::addListener called within Transaction!!	restart the system
RepresentationManager::Destructor caused exception, Open Transaction!!	restart the system

Error Messages	Actions
RepresentationManager::pActualUnitWrtAddr called within Transaction!!	restart the system
RepresentationManager::pNextUnitsCompleted called within Transaction!!	restart the system
RepresentationManager::removeAllListener called within Transaction!!	restart the system
RepresentationManager::removeListener called within Transaction!!	restart the system
RepresentationManager::vClear called within Transaction!!	restart the system
RepresentationManager::vCreate: Dimension unknown, arguments of vSetReplayParams() incorrect!!	restart the system
RepresentationManager::vCreate: Nr. Dim 0 incorrect, see vSetReplayParams() call	restart the system
RepresentationManager::vCreate: Nr. Dim 1 incorrect, see vSetReplayParams() call	restart the system
RepresentationManager::vCreate: Nr. Dim 2 incorrect, see vSetReplayParams() call	restart the system
RepresentationManager::vResizeBufferLength called within Transaction!!	restart the system
RepresentationManager::vResizeBufferLength caused exception, replay buffer is not empty!!	restart the system
RepresentationManager::vSetGeoDescription called within Transaction!!	restart the system
RepresentationManager::vSetReplayParams called within Transaction!!	restart the system
Restore error (Error while reading backup data.)	Backup data are probably damaged. Try again or load another backup.
RiseSmooth Out Of Range	press ok and save this user-setting once again
RT_4DTissueFilterBlock:: Storage Error, no dynamic memory for filter operations available!!	restart the system
RT_4DTissueFilterBlock:: storage needed for one filtered volume differs from available Unitsize within replay buffer!!	restart the system
RT_4DTissueFilterBlock::bDllLineFilter call failed!!	restart the system
RT_4DTissueFilterBlock::bDllLineFrameFilter call failed!!	restart the system
RT_4DTissueFilterBlock::DMA Block size and calculated frame size differs!!	restart the system
RT_ColorFlowFilterBlock Constructor: Memory allocation failed	restart the system
RT_ColorFlowFilterBlock::vCheckIQDataSizeAndUpdateTables: Memory allocation failed	restart the system
RT_ColorFlowFilterBlock::vDebugDrawIQDataCurve: Memory allocation failed	restart the system

Error Messages	Actions
RT_ConnectionMngr::vAssembleRTSet: no RT_TissueFilterBlock found for TISSUE3D Blocks	restart the system
RT_ECG_Block::bStart ECGInterface failed!!	restart the system
RT_MColorFilterBlock::RT_MColorFilterBlock: Memory allocation failed	restart the system
RT_MColorFilterBlock::vCheckIQDataSizeAndUpdateBuffer: Memory allocation failed	restart the system
RT_MColorFilterBlock::vDebugDrawIQDataCurve: Memory allocation failed	restart the system
RT_MotionMBlock::execute caused exception:: Addr from DMA= xx, ReplayBuffAddr= xx, (Line+Header)Size= xx, blockLength= xx, value i= xx!!	restart the system
RT_PWorCW_Block::replay buffer size smaller than expected	restart the system
RT_PWorCW_Block::execute caused exception:: Addr from DMA= xx, ReplayBuffAddr= xx, (Line+Header)Size= xx, blockLength= xx, line index= xx!!	restart the system
RT_PWorCW_Block::execute: Error, length of DMA block 2 [xx] is not aligned to linesize!!	restart the system
Start Bandwidth too small	restart the system
Start ET too small	restart the system
Start frequency too small	restart the system
StoragePool: Not sufficient replay storage for B & CF Mode available	restart the system
StoragePool: Not sufficient replay storage for ECG available	restart the system
StoragePool: Not sufficient replay storage for M Mode available	restart the system
StoragePool: Not sufficient replay storage for MC or PW Mode available	restart the system
System detected severe error, please call technical support.	restart the system, call technical support
System detected severe error. Some components like Touch Panel server may not be registered. Please register Touch Panel server and restart.	restart the system, call technical support
The Database UserPrograms Corrupted	restart the system
The Date format not stored properly	close registry, restart, try again
The Handle Unregistered	close registry, restart, try again
The Registry not closed	restart the system
The System detected a problem with your harddisk. Please do not reboot or shut down the machine! Please contact your service department as soon as possible.	if possible, • save “Full Backup” (see: Section 4-5-3 on page 4-36) to “DVD/CD”, “Network”, or “Other drive” (including images) • if not currently done, save all images via Sonoview (see: Section 4-5-6 on page 4-41) , • call technical support

Error Messages	Actions
Thickness mismatch xx - GIP xx	restart 3D (go to 2D); restart the system
UI_BBC_Wnd::vSet() has an wrong ImageType	restart the system
UI_BBC_Wnd::vSet() will change from eB_Wnd to wrong ImageType	restart the system
UI_BBC_Wnd::vSet() will change from eBBC_Wnd to wrong ImageType	restart the system
UI_Manager::vDestroyWnd: dynamic cast to UI_MMC_Wnd* failed	restart the system
UI_Manager::vDestroyWnd: dynamic cast to UI_PW_Wnd* failed	restart the system
UI_Manager::vHRS_Execute multiple call	restart the system
Unable to save...	restart the system
undefined CW ADC_Clk-Teiler	restart the system
Unknown Error	load volume files from other storage medium
unknown Xilinx-Version	restart the system
unrecordable disc in drive	try again with another disk
Unsupported color mode	restart the system
Verify error (Error while checking backup data.)	Backup data are probably damaged. Try again or load another backup.
ViewerConMngr::vAssembleCF_DFE: attempt to get ECG_Consumer_2D- or ECG_Draw_2D-Block from ECGViewer Objects failed!!	restart the system
ViewerConMngr::vAssembleM_DFE: attempt to get ECG_Consumer_2D- or ECG_Draw_2D-Block or ECG-CalcHR-Block from ECGViewer Objects failed!!	restart the system
Volume_dB Out Of Range	press ok and save this user-setting once again
WMF_KoefBlock: SamplePRF too big	restart the system
XTD - pucBackScaledBImage: Memory allocation failed	restart the system
XTD - pucDSCBImage: Memory allocation failed	restart the system
XTDTrackballCtrlState::No frame to trackball position found, internal failure!!	restart the system

Chapter 8
Replacement Procedures

Section 8-1
Overview

8-1-1 Purpose of Chapter 8

This chapter contains replacement procedures for different modules and their subsystems.

NOTICE The **Manpower**, time and **Tools** indicated in the Sub-sections include all requirements from **Preparations** to **Installation Procedures**.

WARNING ***No covers or panels should be removed from the system (high-voltage risk). Service and repairs must only be performed by authorized personal. Attempting do-it-yourself repairs invalidate warranty and are an infringement to regulations and are inadmissible acc. to IEC 60601-1.***

The waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately.
Please contact the manufacturer or other authorized disposal company for information concerning the decommission of your equipment.

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8-1-2 Returning/Shipping Probes and Repair Parts

Equipment being returned must be clean and free of blood and other infectious substances.

GEMS policy states that body fluids must be properly removed from any part or equipment prior to shipment. GEMS employees, as well as customers, are responsible for ensuring that parts/equipment have been properly decontaminated prior to shipment. Under no circumstance should a part or equipment with visible body fluids be taken or shipped from a clinic or site (for example, body coils or and ultrasound probe).

The purpose of the regulation is to protect employees in the transportation industry, as well as the people who will receive or open this package.

NOTE: The US Department of Transportation (DOT) has ruled that "items what were saturated and/or dripping with human blood that are now caked with dried blood; or which were used or intended for use in patient care" are "regulated medical waste" for transportation purpose and must be transported as a hazardous material.

Section 8-2
Ultrasound Application Software (UIS) Installation Procedure

8-2-1 Introduction

NOTICE It is possible to update the Ultrasound Application Software via the UPDATE button in the System Setup SERVICE page; see: Section 8-2-5 on page 8-7.

8-2-2 Manpower

One Person, 20 min.

8-2-3 Tools

System DVD

8-2-4 Preparations

Before performing the Software Update/Upgrade:

A.) make sure that all system functions are working correct

B.) check the current Software Version and installed Options

1.) Press the **UTILITIES** key on the control panel once to display the Utilities menu.

2.) Select the SYSTEM item from the Utilities menu - which is displayed on the left side of the screen.

3.) Select the SYSTEM INFO page on the System Setup desktop screen to see which Software/Hardware version is installed in the unit.

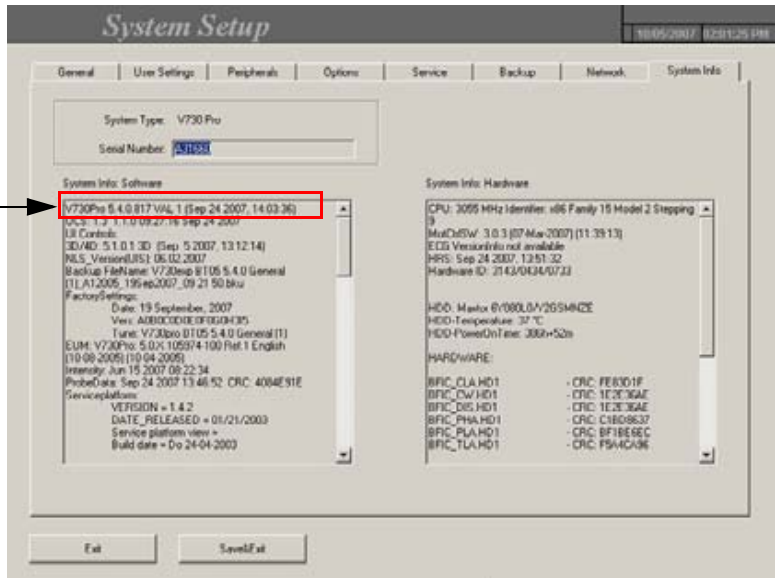


Figure 8-1 Version check

8-2-4 Preparations (cont'd)

4.) Select the **OPTION** page on the System Setup desktop screen to see which Options are installed.

D = Demo
(Option is activated for demo and expires on the date shown in the "Valid" column)

I = Inactive
(Option is not activated)

P = Permanent
(Option is permanently activated [purchased])

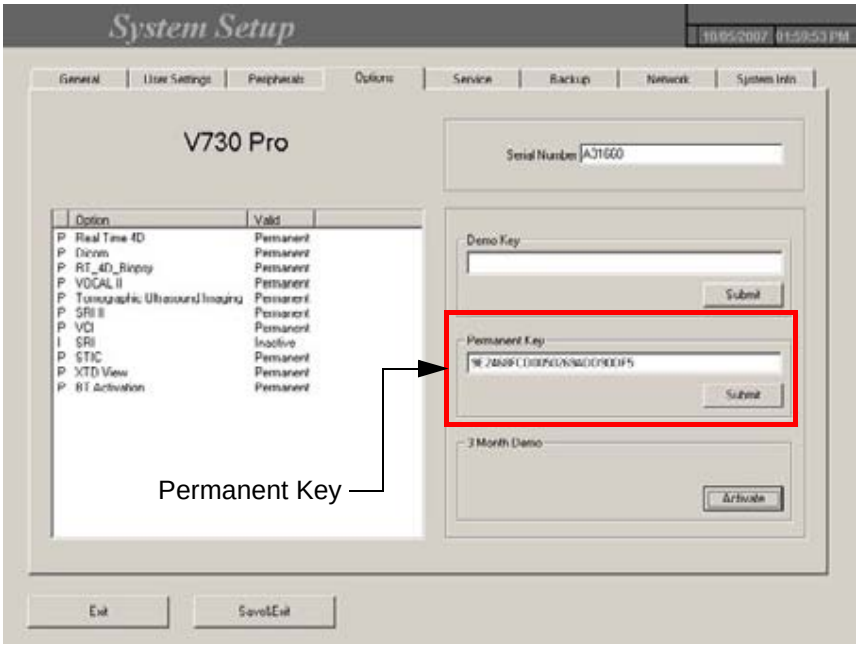


Figure 8-2 Option page (e.g. V730 Pro)

NOTICE Please print out the **OPTION** page or write down the "Permanent Key"!

5.) Select the **NETWORK** page on the System Setup desktop screen.

a.) Click on the DICOM / SONOVIEW CONFIGURATION button in the **NETWORK** page.

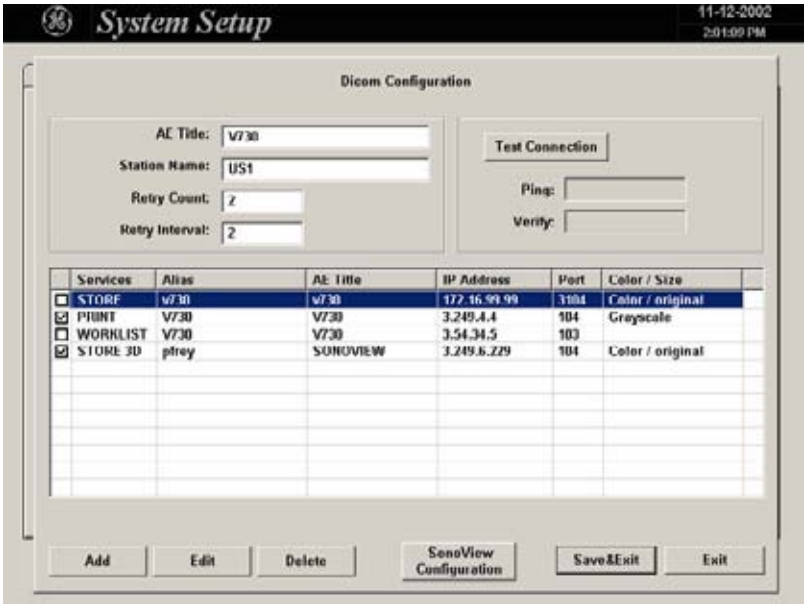
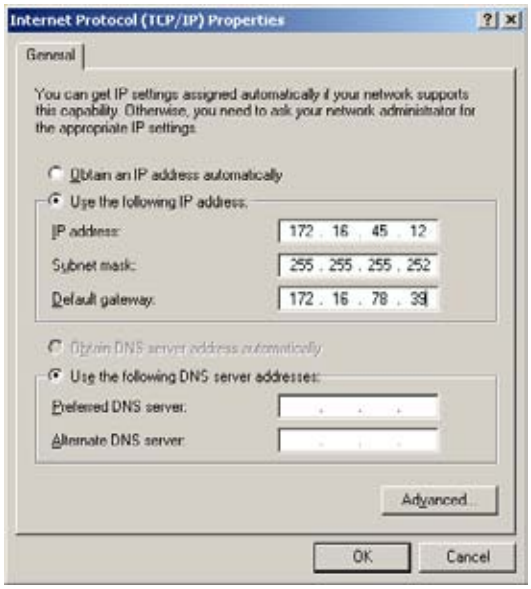


Figure 8-3 DICOM Configuration

NOTICE Please print out the "DICOM Configuration" dialog page or write down the DICOM designations (AE Title, Station name, Retry Count, Retry Interval).

8-2-4 Preparations (cont'd)

b.) Click on the NETWORK CONFIGURATION button in the **NETWORK** page.


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
172 . 16 . 45 . 12
Subnet mask:
255 . 255 . 255 . 252
Default gateway:
172 . 16 . 78 . 39
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

NOTE:This example shows fictional numbers!

Figure 8-4 Internet Protocol (TCP/IP)

NOTICE Please print out the "Internet Protocol (TCP/IP) Properties" dialog page or write down the IP settings.

8-2-5 Software - Installation Procedure (via Service Page)

1.) Insert the System DVD into the drive.

2.) Press the **UTILITIES** key and then select SYSTEM item from the Utilities menu.

3.) Select the **SERVICE** page.

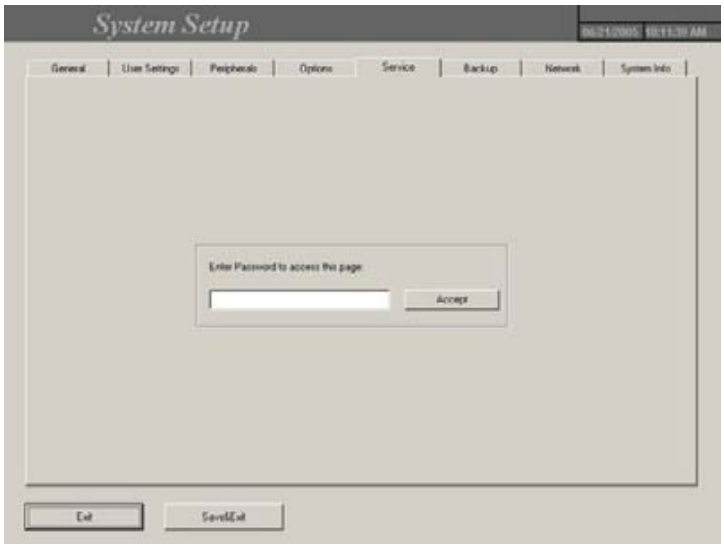


Figure 8-5 System Setup Service

4.) Type in the password SHE and click ACCEPT.

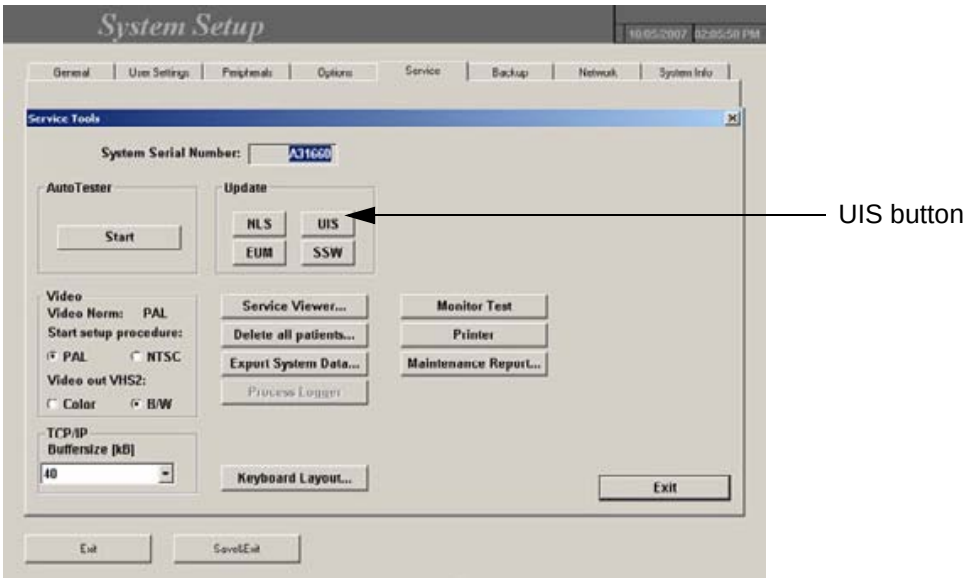


Figure 8-6 Service Tools

5.) Click on the UIS button for updating the Ultrasound Application Software.

8-2-5 Software - Installation Procedure (via Service Page) (cont'd)

6.) Confirm the following message with YES.

Update UIS Package
This will install a different version of your ultrasound application. Do you really want to continue?
Yes
No

Figure 8-7 Update UIS message

7.) A new window pops up on the screen and the InstallShield starts extracting files.

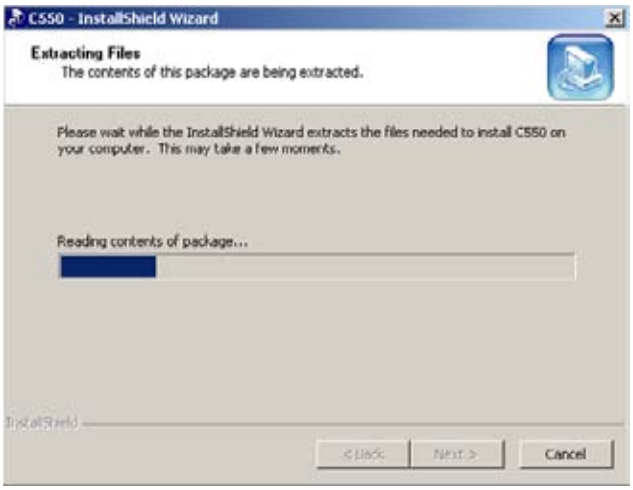

C550 - InstallShield Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield Wizard extracts the files needed to install C550 on your computer. This may take a few moments.
Reading contents of package...
InstallShield
< Back
Next >
Cancel

Figure 8-8 Install Shield Wizard - Extracting Files

8.) Click the NEXT button In the "Welcome to Kretz V730 Software Installation" window.

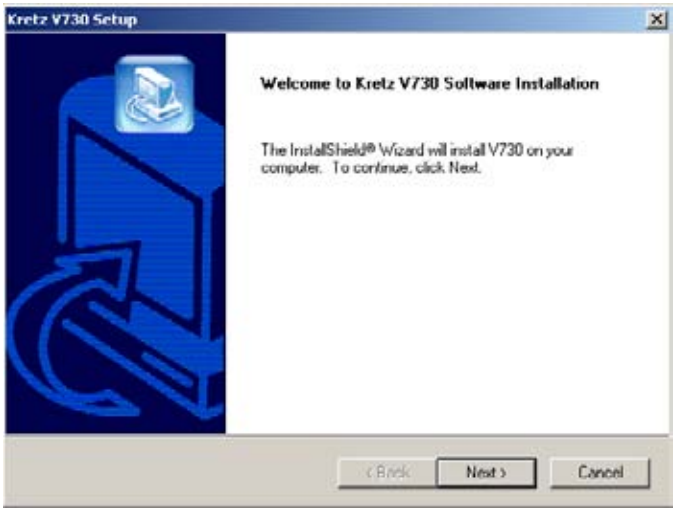

Kretz V730 Setup
Welcome to Kretz V730 Software Installation
The InstallShield® Wizard will install V730 on your computer. To continue, click Next.
< Back
Next >
Cancel

Figure 8-9 Welcome to ... Software Installation

The contents of the Software package are being extracted.

8-2-5 Software - Installation Procedure (via Service Page) (cont'd)

9.) Complete the Software installation with the FINISH key.

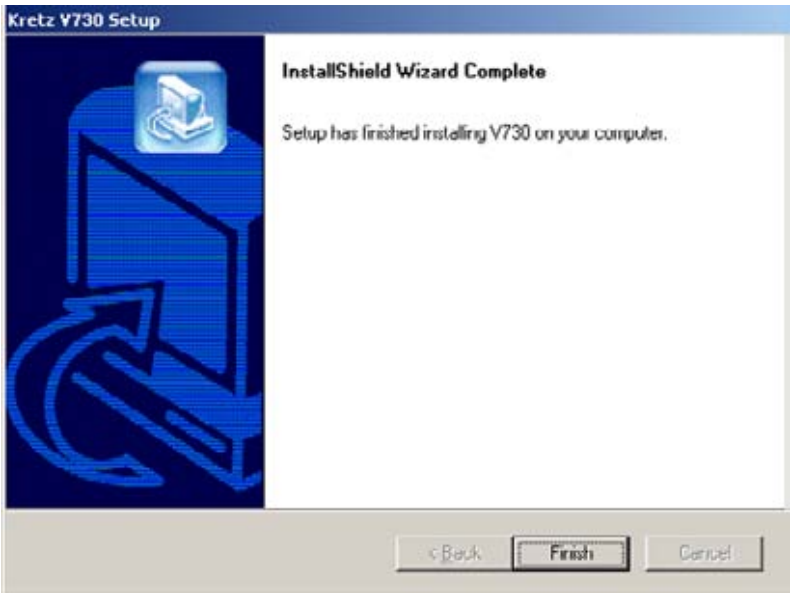


Figure 8-10 V730 Software Setup

The system restarts automatically.

10.) If desired, load the appropriate factory settings; see Section 8-3 on page 10 or the full backup; see: Section 8-4 on page 8-10.

11.) If necessary, update the Service Software (SSW) as described in Section 8-5 on page 8-11.

12.) Afterwards update the Electronic User Manual (EUM) as described in Section 8-6 on page 8-13.

13.) Perform Software and Functional checks as described in Section 8-7 on page 8-16.

Section 8-3
User Settings Only (Application Settings) Loading Procedure

8-3-1 Introduction

The User Settings contains:

- Application Settings
- User Programs
- Auto Text
- 3D/4D Programs

8-3-2 Loading Procedure

see: Section 4-5-2 "Load User Settings Only (Application Settings)" on page 4-34

Section 8-4
Full Backup (Presets, Configurations & Appl. Settings) Loading Procedure

8-4-1 Introduction

The Full Backup contains following data:

- Patient demographic and exam data (database containing the patient data and measurements)
- SonoView image data (**NOT** available when saving to the internal hard disk, DVD/CD or MOD)
- User Settings (databases and files containing gray curves and the user settings.)
- Image transfer settings (DICOM settings e.g., DICOM servers, AE Title, Station Name, etc.)
- Measure Setup Settings (user specific measure settings)
- V730 settings (general settings such as language, time/date format and the enabled options)
- Windows Network Settings (network settings including the computer name)
- Service Platform (state of the service platform)
- VP (additional system data)

8-4-2 Loading Procedure

see: Section 4-5-4 "Load Full Backup (Presets, Configurations & Application Settings)" on page 4-38

Section 8-5
Service Platform (SSW) Upgrade Procedure

8-5-1 Manpower

One Person, 10 min.

8-5-2 Tools

System DVD or Upgrade CD

8-5-3 Upgrade Procedure

1.) Insert the System DVD or Upgrade CD into the drive.
2.) Press the **UTILITIES** key on the control panel once to display the Utilities menu.
3.) Select the SYSTEM item from the Utilities menu - which is displayed on the left side of the screen.
4.) Select the **SERVICE** page.
5.) Enter the password **SHE**, and click the ACCEPT.
6.) The “Service Tools” menu appears on the screen.

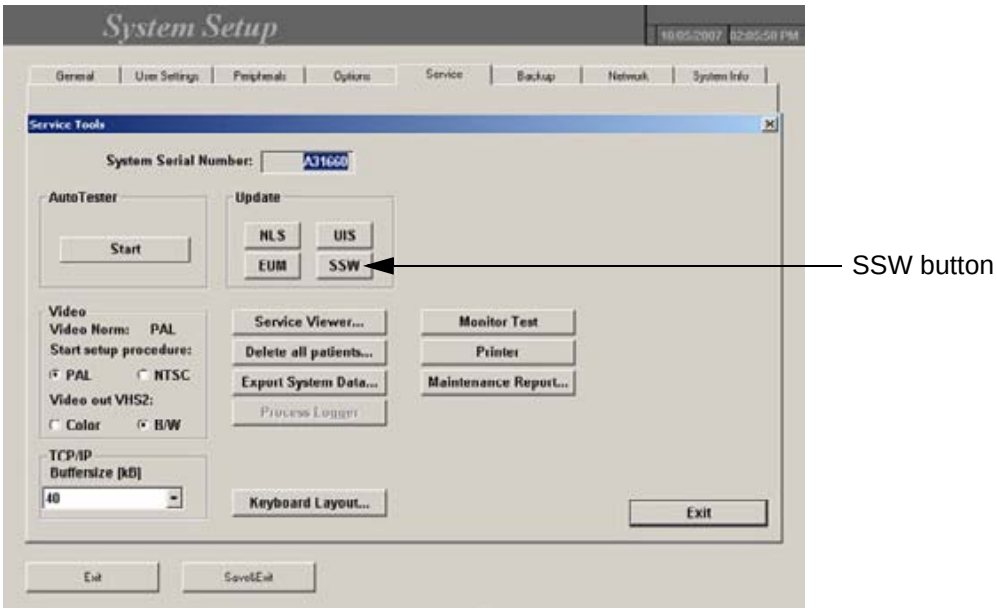


Figure 8-11 Service Tools

7.) Click on the SSW button for updating the Service Platform Software.

Section 8-5 Service Platform (SSW) Upgrade Procedure (cont'd)

8.) Select the DVD/CD DRIVE button.

9.) Browse for the **install.bat** file and click OK.

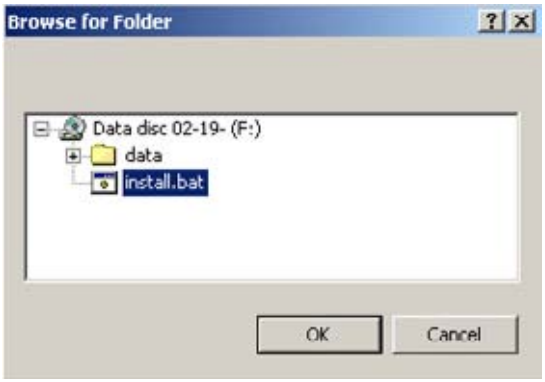


Figure 8-12 Browse for Folder

10.) Confirm the following message with YES.

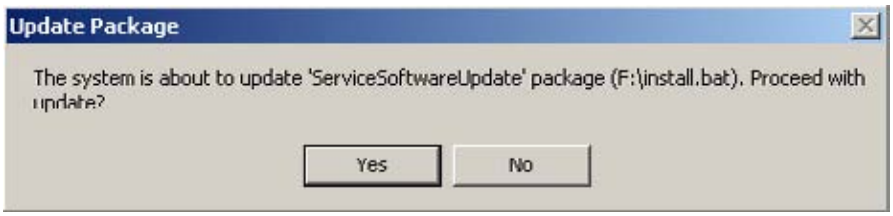


Figure 8-13 Update SSW message

11.) A new window pops up on the screen and the InstallShield starts extracting files.

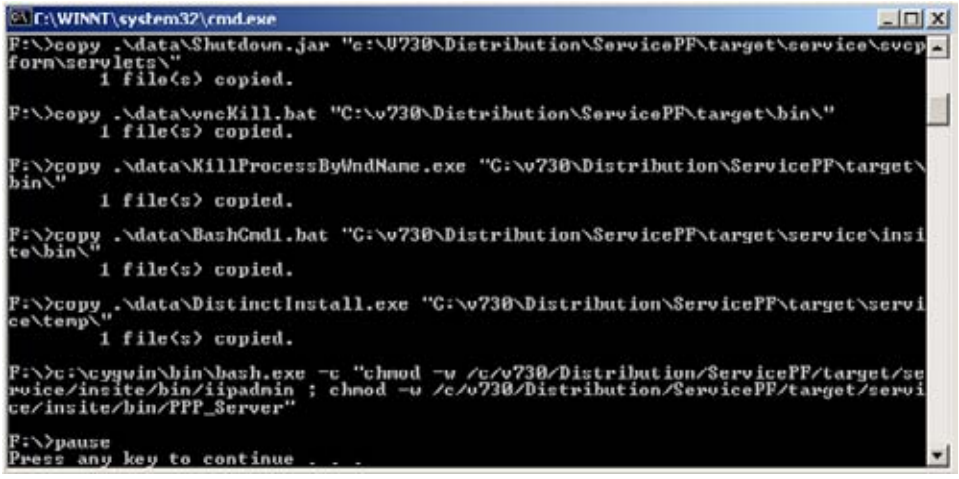


Figure 8-14 Install Shield Wizard - Extracting Files

12.) *Press any key to continue* to finish Service Platform installation procedure.

13.) Close the **SERVICE** page with EXIT and close the "System Setup" with SAVE & EXIT.

14.) If necessary, perform Service Platform checkout.

Section 8-6
Electronic User Manual (EUM) Upgrade Procedure

8-6-1 Manpower

One Person, 15 min.

8-6-2 Tools

System DVD or Upgrade CD

8-6-3 Preparations

1.) Restart the system (turn off and on the system).

NOTICE The electronic user manual (EUM) **must never** be opened (by pressing the **F1** key on the keyboard) after last restart! Even if closed again before installing the new EUM.

2.) Insert the System DVD or Upgrade CD into the drive.
3.) Press the **UTILITIES** key on the control panel once to display the Utilities menu.
4.) Select the SYSTEM item from the menu area to invoke the setup desktop on the screen.
5.) Select the SERVICE page.
6.) Enter the password **SHE**, and click the ACCEPT.
7.) The “Service Tools” menu appears on the screen.

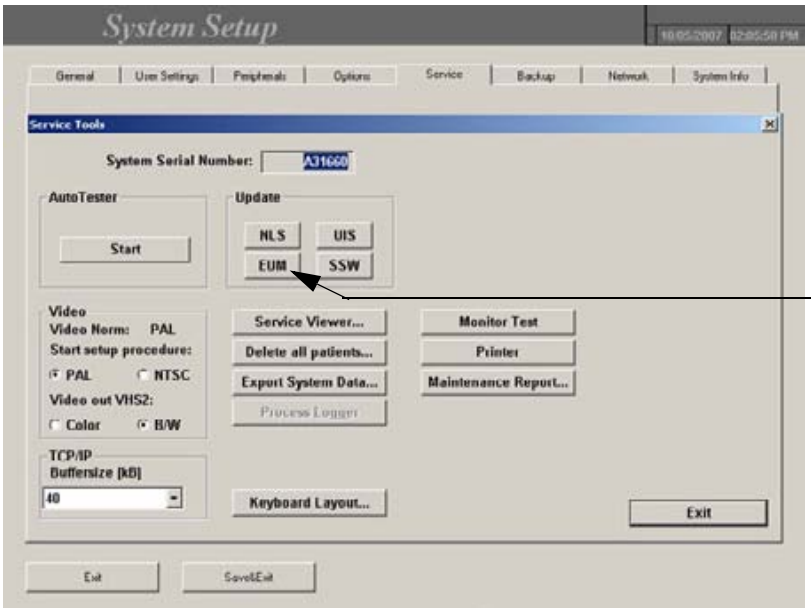


Figure 8-15 Service Tools

8-6-4 EUM - Upgrade Procedure

1.) Click the EUM button. The “Update Software” dialog appears.

2.) Select the DVD/CD DRIVE button.

3.) Browse for the **EUMSetup_en_V730Pro.exe** file and click OK.

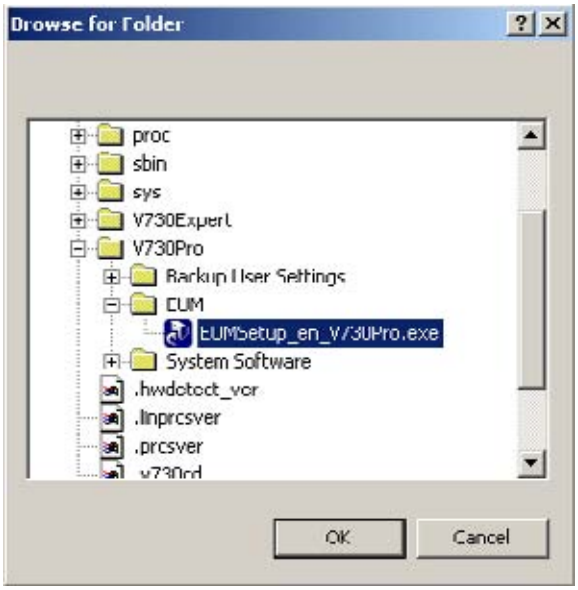


Figure 8-16 Browse for Folder

4.) Confirm the following message with YES to proceed the update.

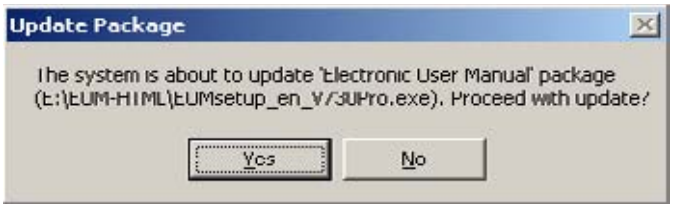


Figure 8-17 Update Package

The contents of this package are being extracted.

5.) Confirm the following warning message with OK to proceed the update.

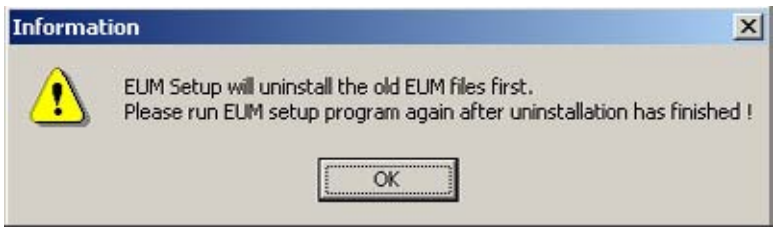

Information
EUM Setup will uninstall the old EUM files first.
Please run EUM setup program again after uninstallation has finished !
OK

Figure 8-18 confirm warning message

6.) Confirm the “Maintenance Complete” message: «InstallShield Wizard has finished performing maintenance operations on V730 Pro User Manual» with the FINISH button.

8-6-4 EUM - Upgrade Procedure (cont'd)

7.) Click the EUM button again to install the new EUM.

8.) Select the MO DRIVE or the DVD/CD DRIVE button, depending on the storage medium you use.

9.) Browse for the **EUMSetup_en_V730Pro.exe** file again and click OK.

10.) Confirm the following message with YES to proceed the update.

The contents of this package are being extracted.

11.) Follow the instructions of the "InstallShield Wizard" (confirm the messages with the NEXT key).

12.) After successfully installation of the Electronic User Manual, click FINISH to exit the wizard.

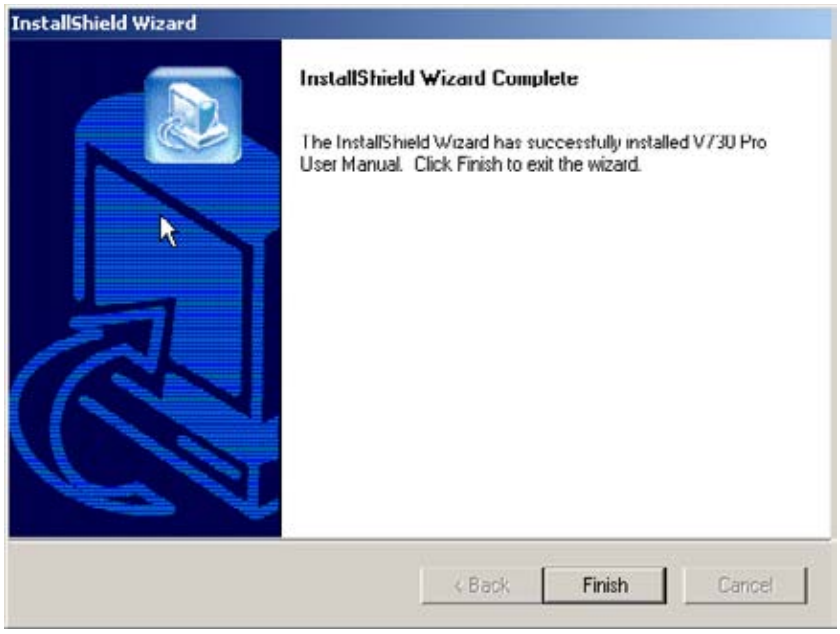

InstallShield Wizard
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed V730 Pro User Manual. Click Finish to exit the wizard.
< Back
Finish
Cancel

Figure 8-19 Complete Installation

13.) Close the **SERVICE** page with EXIT and close the "System Setup" with SAVE & EXIT.

14.) Restart the system (turn off and on the system).

15.) After rebooting the system, fill in the requested information into the "System Status Messenger" box and click OK.

16.) Press the **F1** key on the keyboard to invoke the electronic user manual.

17.) Press the **EXIT** key to exit the EUM.

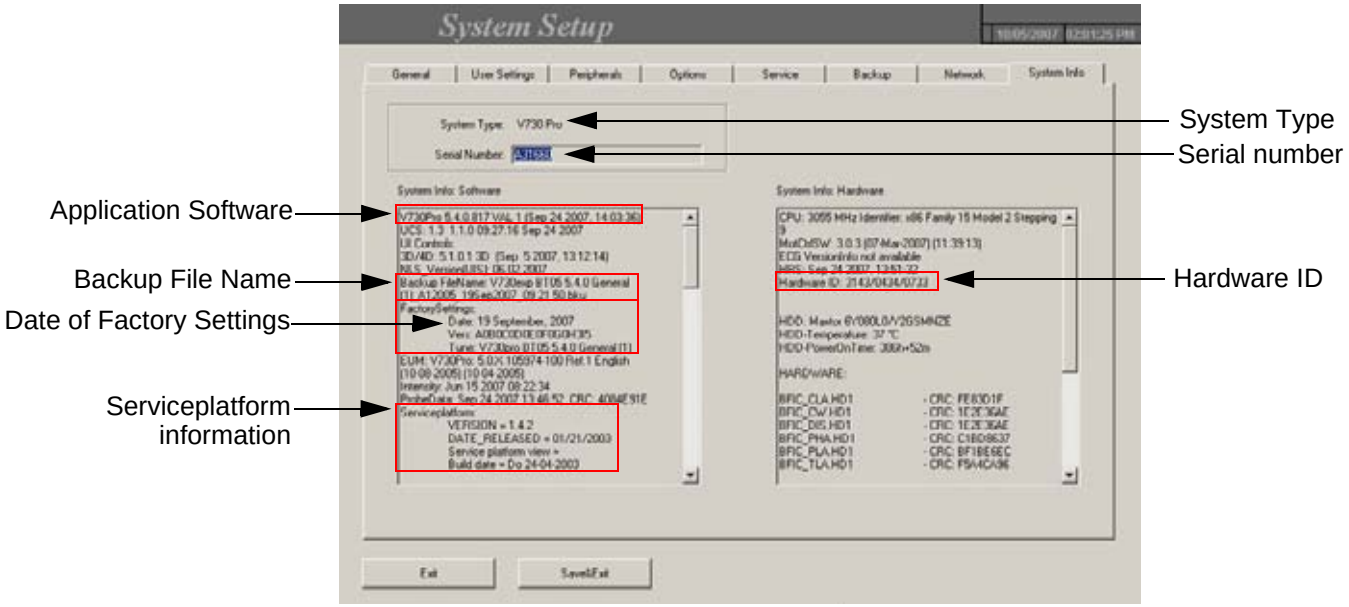
NOTE: If desired, change the EUM Language as described in Section 3-8-1-4 on page 3-61.

Section 8-7
Software and Functional Checks after the Upgrade

1.) Press the **UTILITIES** key on the control panel once to display the Utilities menu.

2.) Select the SYSTEM item from the Utilities menu - which is displayed on the left side of the screen.

3.) Select SYSTEM INFO to see which Software/Hardware version is installed in the unit.



Move the scroll bar downwards to review additional information about installed software/hardware.

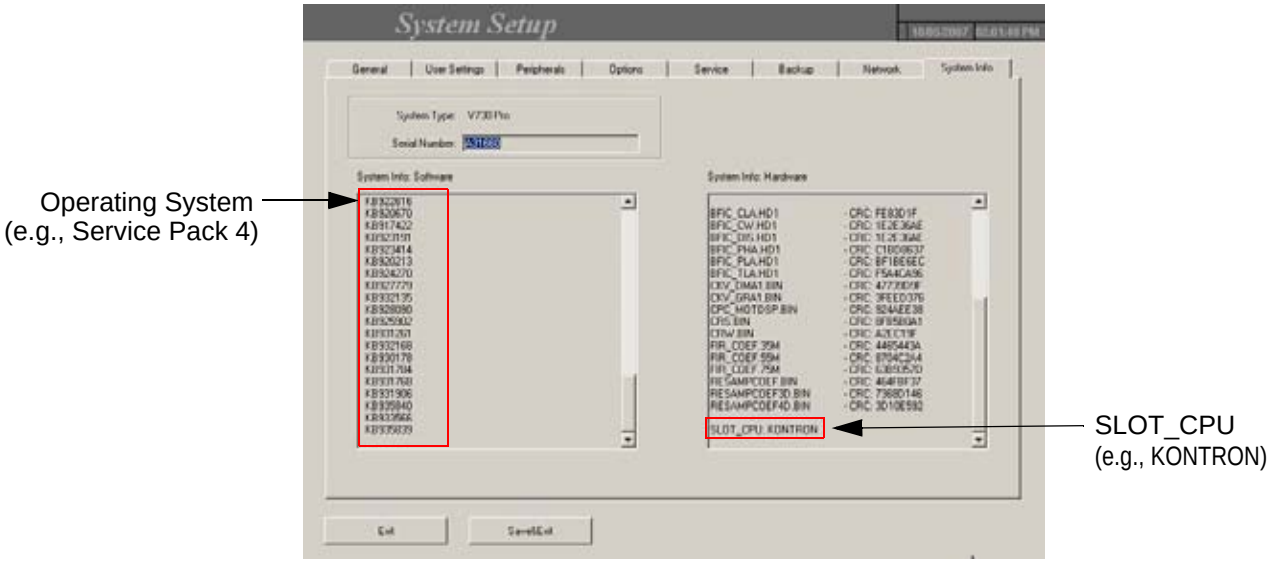


Figure 8-20 System Setup - System Info page

4.) Verify the correct settings of the OPTION page; see: Figure 8-2 on page 8-5.
If necessary, customize the settings according to the printout.

5.) Check and (if necessary) match the NETWORK page settings according to the printout:
- "DICOM Configuration" dialog page; see: Figure 8-3 on page 8-5
- "Network Configuration" dialog page; see: Figure 8-4 on page 8-6

6.) Restart the system and perform basic functional checks to ensure system is functioning normally.

Section 8-8
Replacement or Activation of Options

NOTICE Not all Options are available on the Voluson® 730ProV (marked with * in this manual).

Following Options are available:

at BT05 systems (SW 5.0.x - 5.3.x)	at BT08 systems (SW 5.4.x onwards)
Real Time 4D	Real Time 4D
DICOM	DICOM
Real Time 4D Biopsy*	Real Time 4D Biopsy*
VOCAL II*	VOCAL II*
Tomographic Ultrasound Imaging'* (T.U.I.)	Tomographic Ultrasound Imaging* (T.U.I.)
SRI II* (Speckle Reduction Imaging) Enhanced version (Software **5.0.3** or higher is required)	SRI II* (Speckle Reduction Imaging) Enhanced version
VCI* (Volume Contrast Imaging)	
SRI* (Speckle Reduction Imaging)	SRI* (Speckle Reduction Imaging)
STIC* (Spatio-Temporal Image Correlation)	STIC* (Spatio-Temporal Image Correlation)
XTD View (Extended View) (Software **5.2.0** or higher is required)	XTD View (Extended View)

NOTE: Additional option fields are not yet implemented in the Voluson® 730Pro/ProV.

8-8-1 Operation for activating Options

1.) Press the **UTILITIES** key on the control panel once to display the Utilities menu.
2.) Select the SYSTEM item from the menu area to invoke the setup desktop on the screen.
3.) Select the OPTION page where you can see which options are installed in the system.

D = Demo
(Option is activated for demo and expires on the date shown in the "Valid" column)

I = Inactive
(Option is not activated)

P = Permanent
(Option is permanently activated [purchased])

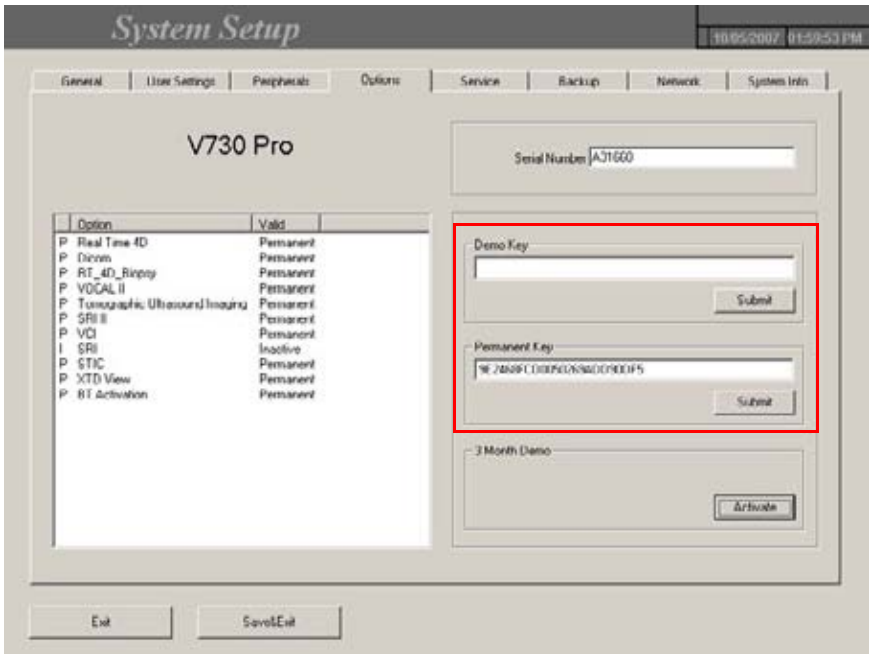


Figure 8-21 Option page in the System Setup (Voluson® 730Pro - BT08)

8-8-1 Operation for activating Options (cont'd)

D = Demo
(Option is activated for demo and expires on the date shown in the "Valid" column)

I = Inactive
(Option is not activated)

P = Permanent
(Option is permanently activated [purchased])

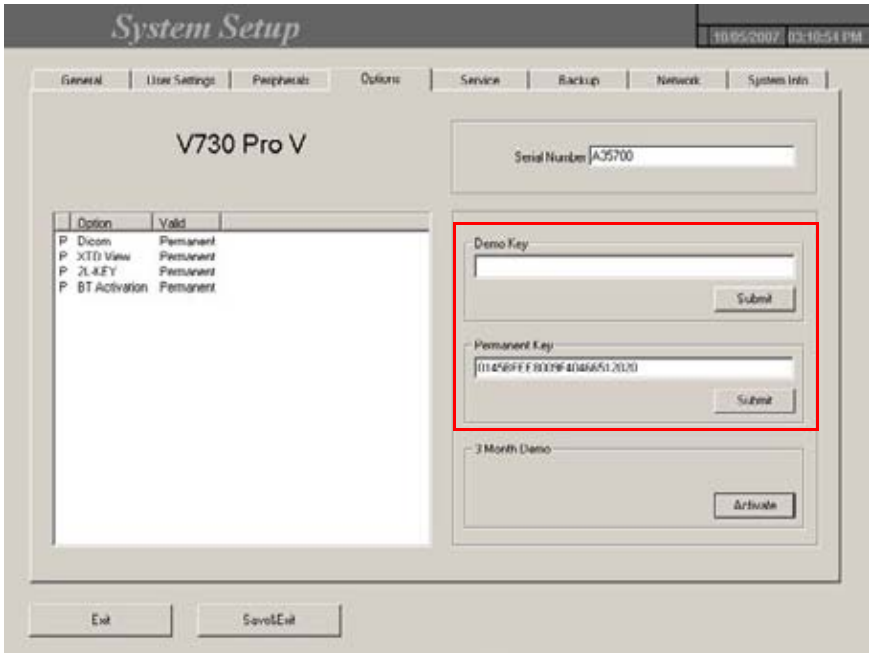


Figure 8-22 Option page in the System Setup (Voluson® 730ProV - BT08)

NOTE: For more detailed description of Software Options and Application Packages (Voluson® 730Pro BT08 only) refer to: Description of Software Options on page 5-15.

8-8-1-1 Operation for installing a "Demo Key" or a "Permanent Key":

1.) Position the cursor inside the input field desired and press the **right/left trackball** key.
2.) If one exists, clear/edit the current key code.
3.) Enter the encrypted serial code with the keyboard and click on SUBMIT. (Code will be checked.)
4.) Click the SAVE&EXIT button.

NOTE: After activating a key code, restart (turn of and on) the Voluson® 730Pro/ProV system.

Section 8-9
Transfer of Patient Database and Images from System-to-System

8-9-1 Introduction

NOTICE It is possible to backup Sonoview Image data to a Mapped Network Drive (**Z:**)

8-9-2 Transfer of Patient Database and Images via Sonoview

8-9-2-1 Introduction

This section describes how to transfer the complete patient database and images from one system (= **"old"** system) to another system (= **"new"** system) via "Network" drive in Sonoview.

Thus in addition, the patient database and images can be shared between different systems within the same network.

NOTICE Both systems MUST be capable to BACKUP the Sonoview exams to the mapped network drive (**Z:**). This means that both systems have to be:

- a BT´04 or a BT´05,
- a BT´03, with at least Software Version 3.1.x installed and/or
- a BT´02, with at least Software Version 2.2.x installed

8-9-2-2 Manpower

One Person, time depends on amount of stored images

8-9-2-3 Tools

- Mapped Network Drive **Z:** (see: Section 3-11-1 "Map Network Drive" on page 3-70)

8-9-2-4 Backup all Exams of the "old" system

1.) On the system (= **"old"** system) from which the data should be transferred, press the **SONOVIEW** key on the Control panel.

2.) Click on the OPEN icon on the upper left side of the screen and verify that "Drive **HDD**" is selected.

3.) Using the **TRACKBALL**, and the right trackball key **SET**, select the first exam of the list.

4.) To select all available exams, click on SELECT TO END and then on the BACKUP button.

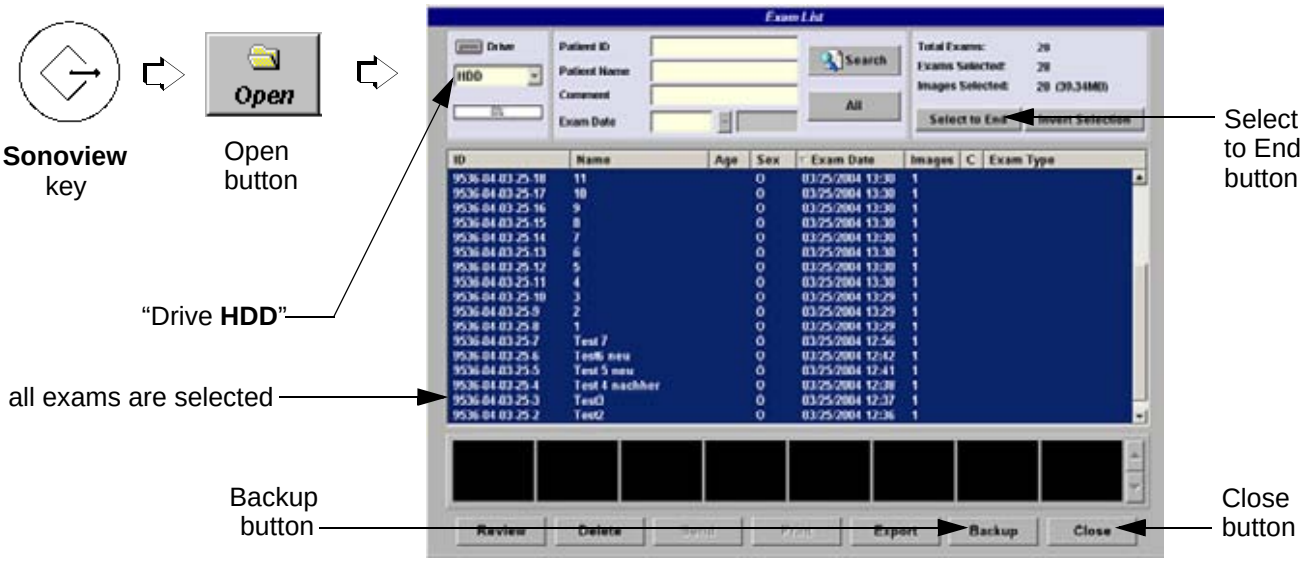


Figure 8-23 Step 1.) to 5.)

5.) In the "Backup" window select the destination NET.

6.) After finishing the backup, select whether the selected exam(s) is to be deleted or not.

NOTICE If you select to delete the exams after finishing the backup, they will be absolutely deleted from the hard disk of the ultrasound scanner Voluson® 730Pro/ProV!

8-9-2-4 Backup all Exams of the "old" system (cont'd)

7.) Click on the close button and then select the SETTINGS icon on the left side of the screen.

8.) In the displayed window click on the CHANGE BACKUP FOLDER ON NETWORK DRIVE button.

The first line in the dialog (see: Figure 8-24) displays the name (e.g., serial number A09008) of the "Backup Folder" used for storing data on, and reading data from the network drive.

Figure 8-24 Backup Folder on Network Drive

9.) Notice this name of the **"old"** system´s Backup Folder (**e.g., A09008**) and then click CANCEL.

8-9-2-5 Restore all Exams (of the "old" system) to the "new" system

1.) On the system (= **"new"** system), that should receive data and images, press the **SONOVIEW** key on the Control panel.

2.) Select the SETTINGS icon on the left side of the screen.

3.) In the displayed window click on the CHANGE BACKUP FOLDER ON NETWORK DRIVE button.

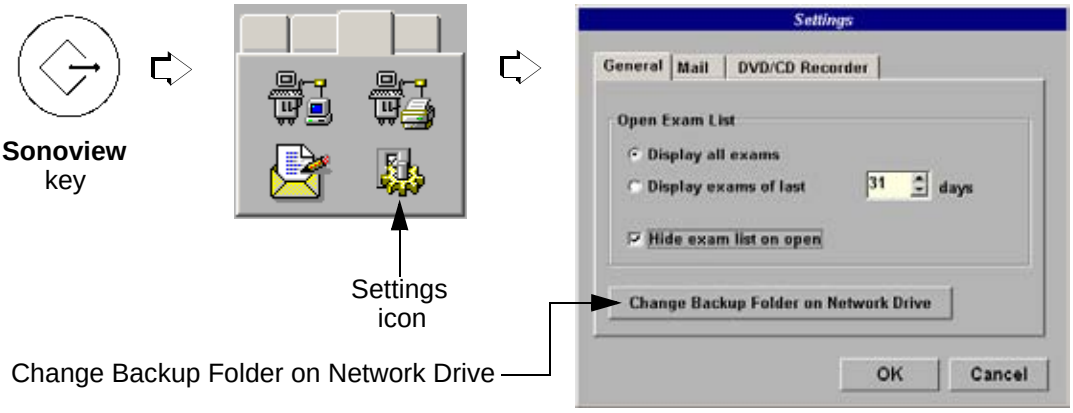


Figure 8-25 Step 1.) to 3.)

4.) Choose folder of the **"old"** system (e.g., A09008) from the drop-down list and click on RENAME.

Figure 8-26 Select folder of "old" system and rename it

8-9-2-5 Restore all Exams (of the "old" system) to the "new" system (cont'd)

NOTICE The folder which is selected to be renamed (e.g., A09008, that contains the backup data from a different system - in this case the backup data of the "old" system), it is not copied, but simply renamed.

Thus, the same data can be shared between two systems by renaming the respective backup folders to the serial number of the accessing system (in this case the "new" system).

5.) Close the "Settings" window with the OK button.

6.) Click on the OPEN icon on the upper left side of the screen and choose "Drive **Network**".

7.) Using the **TRACKBALL**, and the right trackball key **SET**, select the first exam of the list.

8.) To select all available exams, click on the SELECT TO END button.

9.) Click on the BACKUP / RESTORE button.

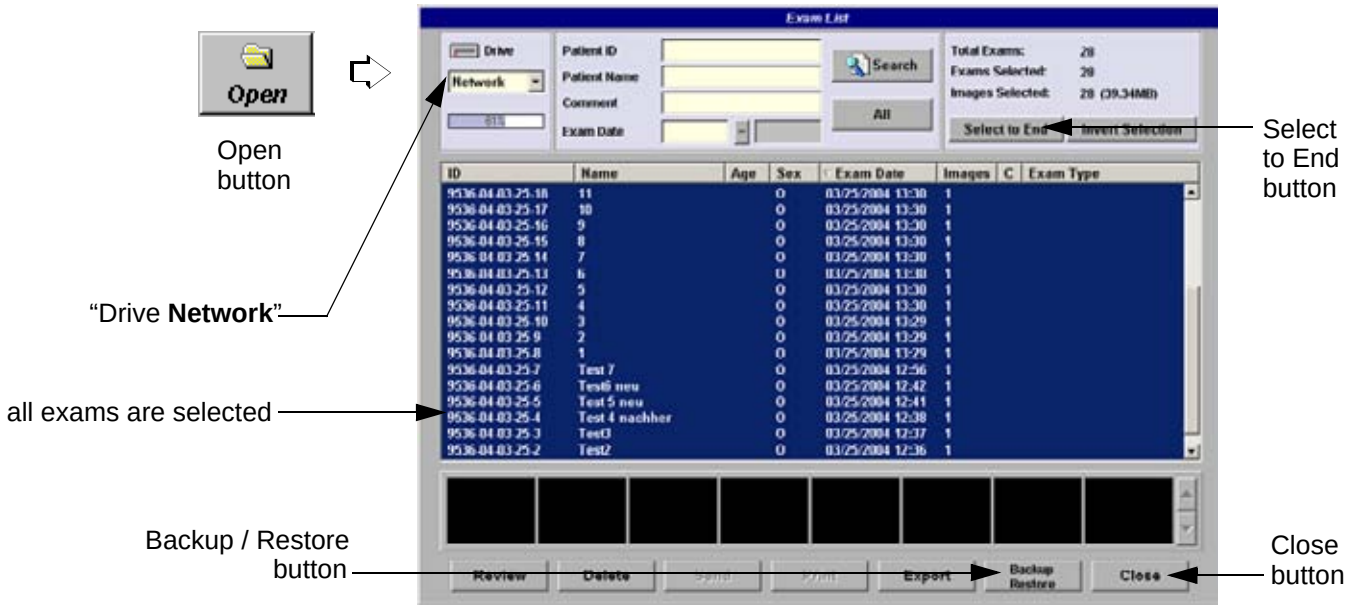


Figure 8-27 Step 5.) to 9.)

10.) In the "Backup / Restore" window click on the RESTORE button.

NOTICE If an exam is about to be restored that already exists on the hard disk of the **"new"** system, a dialog shows the Patient Name and Patient ID and asks for the action to be taken.

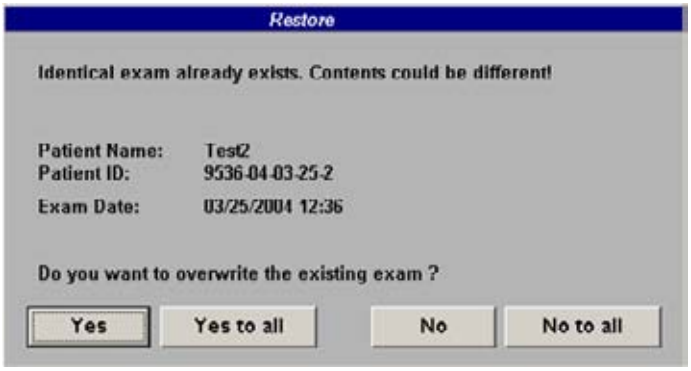


Figure 8-28 Identical exam already exists

8-9-2-5 Restore all Exams (of the "old" system) to the "new" system (cont'd)

11.) Select the desired action:

Yes	The exam on the hard disk is replaced with the exam in the backup. The system will ask again if another identical exam is found during the restore process.
Yes to all	All identical exams are replaced without further notice.
No	The exam on the hard disk is **not** replaced by the exam in the backup. The system will ask again if another identical exam is found during the restore process.
No to all	No identical exams are replaced with the exams in the backup.

12.) After finishing the restore, select whether the selected exam(s) is to be deleted or not.

NOTICE If you select to delete the exams after finishing the restore, they will be absolutely deleted from the network drive!

Section 8-10
Replacement of the Monitor Task Lamp

8-10-1 Manpower

One person, 15 min.

8-10-2 Tools

Philips screwdriver 1 and 2, stubby (length ~30mm)

8-10-3 Preparations

1.) Power Off/Shutdown the system; see: Section 4-3-2 on page 4-3.

8-10-4 Task Lamp - Removal Procedure

1.) Use the stubby screwdriver and unscrew the 2 screws, which fixes the cover of the task lamp.

task lamp

Figure 8-29 remove cover of the task lamp

2.) Screw out the task lamp and remove it.

8-10-5 Task Lamp - Installation Procedure

1.) Screw in the new task lamp into the lamp socket.
2.) Mount the cover of the task lamp and fix it with the 2 screws.

Section 8-11
Replacement of the Trackball top fixation ring

8-11-1 Manpower

One person, 5 min.

8-11-2 Trackball top fixation ring - Replacement Procedure

1.) Remove the fixation ring by turning it counterclockwise.

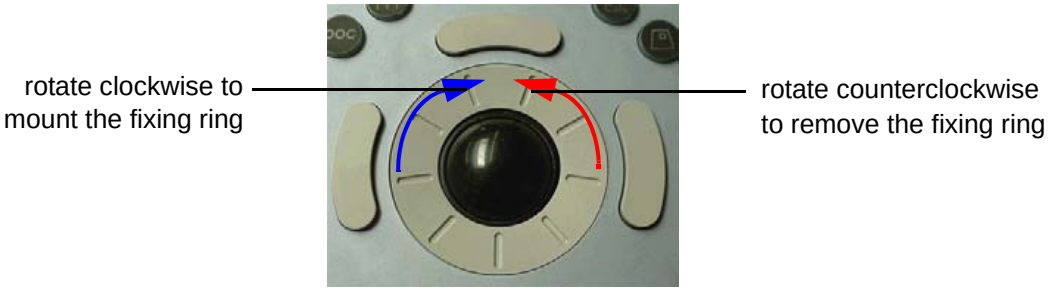


Figure 8-30 Trackball with top fixation ring

2.) Mount the fixation ring by turning it clockwise.

Section 8-12
Replacement of Digipots and TGC Slider controls

8-12-1 Manpower

One person, 5 min.

8-12-2 Tools

small-sized slotted screwdriver or tweezers

8-12-3 Cap and/or Spring - Replacement Procedure

1.) Remove the cap (for Rotation digipots or for Slider-potentiometer TGC).
2.) Mount the cap (for Rotation digipots or for Slider-potentiometer TGC).

Section 8-13
Replacement of the Probe Holder

8-13-1 Manpower

One person, 1 min.

8-13-2 Probe Holder - Replacement Procedure

1.) Remove the probe holder from the bottom housing of the User Interface.
2.) Place the new probe holder on the bottom housing.

Section 8-14
Replacement of Key Caps (by special native language keys)

NOTICE Table 9-12 on page 9-16 shows the available Key Cap Kits.
Keys to be removed depend on the (special native) language kit.

8-14-1 Manpower

One person, 30 minutes

8-14-2 Tools

Use the removal tool which is part of the key cap kits, a commercial key removal tool, or a small-sized slotted screwdriver or tweezers.

8-14-3 Preparations

1.) Power Off/Shutdown the system; see: Section 4-3-2 on page 4-3.

8-14-4 Key Caps - Removal Procedure

1.) Carefully place the removal tool or a small flat screwdriver between the key cap you wish to remove and its neighboring key cap (as shown in Figure 8-31 below).
2.) Gently lift the key cap, until it is completely loosened from its base.
3.) Remove the key cap.

Figure 8-31 removal tool in place

8-14-5 Key Caps - Installation Procedure

1.) Carefully place the appropriate key cap in positionon the keyboard, taking care to place the plastic alignment pin in the correct position so that the key cap is the right way up and reads correctly.
2.) Push the key cap down until it snaps into position.
3.) Power On/Boot Up the system; see: Section 4-3-1 on page 4-2.
4.) Setup the Keyboard Language Layout as described in Section 6-6 on page 6-7 and then type with the keyboard to check the function of each key.

Section 8-15
Replacing optional Peripherals / How to mount Peripherals at a later date

NOTICE Normally auxiliary devices and peripherals come pre-installed with the Voluson® 730Pro/ProV system.

8-15-1 Mounting/Replacing the 19'' LCD secondary "Patient" Monitor

CAUTION **The 19'' LCD secondary "Patient" Monitor MUST NEVER be connected to the Voluson® 730Pro/ ProV ultrasound Systems mains supply directly!**

Always connect it to the supplied Isolation Transformer!

The Secondary Monitor is the only item to be connected to the Transformer!

NOTICE The 19'' LCD secondary "Patient" Monitor is NOT intended for diagnostic use.
It is an additional device used to allow the patient to watch the proceedings.
Take your time to think about the best position of the monitor in your facilities.
Patients should be able to view the monitor easily and without having to bend or turn around.

NOTICE DO NOT connect the 19'' LCD secondary "Patient" Monitor to the Voluson® 730Pro/ProV via USB cable. Use the supplied VGA cable.

NOTICE For more detailed description, how to mount/replace the 19'' LCD secondary "Patient" Monitor refer to:
Section 3-5-12 "Worldwide 19'' secondary "Patient" Monitor kit" on page 3-25

Chapter 9
Renewal Parts

Section 9-1
Overview

9-1-1 Purpose of Chapter 9

This chapter gives you an overview of Spare Parts available for the Voluson® 730Pro/ProV.

*NOTE: Furthermore refer to **SN79040**, which is the best source for new FRU parts that are not yet implemented in this Service Manual.*

Table 9-1 Contents in Chapter 9

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Section 9-2
List of Abbreviations

AC	Alternating Current
ADC	Analog to Digital Converter
ASIC	Application Specific Integrated Circuit
Assy	Assembly
BEP	Back End Processor
CKV	Video Converter Board
CPD	Sub-Board on Beamformer (CPR)
CPE	Motherboard Extension (Backpanel I/O-Card)
CPK	Motherboard of GEZ-Module
CPN	Primary Power Supply Module
CPP	Power Supply Secondary Board + Motor Power stage
CPR	Beamformer Motherboard
CPU	Central Processing Unit
CPV	Probe Connector Board
CPY	Power Switch Board
CPZ	Cover Board
CRB	USB to IDE Converter Board
CRS	Signal Processing Board--/
CRU	Customer Replaceable Unit
CRW	CW-Doppler Board (optional)
CSD	Common Service Desktop
DAC	Digital to Analog Converter
DC	Direct Current
DSP	Digital Signal Processing
EUM	Electronic User Manual
FRU 1	Replacement part available in parts hub
FRU 2	Replacement part available from the manufacturer (lead time involved)
GEB	PC-Box (Backend Processor)
GEM	Disk Drive module (with or without MO-Drive and MAN)
GES	I/O-Interface (User accessible)
GEU	User interface: Keyboard, EL-Display, TGC Unit
GEZ	Main Board Module (Ultrasound (FrontEnd) and PC-Board (Backend Processor))
GW	Console housing (except GEU and GEM)
HDD	Hard Disk Drive
Int	Internal
I/O	Input/Output
LCD	Liquid Crystal Display
MAN	ECG module
MOD	Magneto Optical Disk
SBC	Single Board Computer (PC-Board)
SMBus	System Management Bus
SSW	Service Software (Service Platform)
UIS	Ultrasound Application Software

Section 9-3
Parts List Groups

Figure 9-1 Console Views

Table 9-2 Mechanical and user accessible parts

Item	Part Group Name	Table Number	Description
100-	Housing (GW) and additional Console Hardware	Table 9-3 on page 9-5	GW -Console housing (except GEU and GEM)
200-	User Interface (GEU Top Console)	Table 9-4 on page 9-7	GEU - User interface: Keyboard, TGC Unit
250-	Monitor + Monitor replacement parts	Table 9-5 on page 9-8	Monitor + Monitor replacement parts
300-	Disk Drives (GEM)	Table 9-6 on page 9-9	GEM - Disk Drive module (with or without MAN)
400-	Main Power Module (CPN)	Table 9-7 on page 9-10	CPN - Primary power module
500- 510- 570-	Main Board Module (GEZ) • FrontEnd (US-Part) • FrontEnd (US-Part) cont´d • Back Processor (PC-Part)	Table 9-8 on page 9-11 Table 9-9 on page 9-12 Table 9-10 on page 9-13 Table 9-11 on page 9-15	GEZ - Main Board Module Ultrasound (FrontEnd) PC-Boards (Backend Processor)
600-	Options and Upgrades	Table 9-12 on page 9-16	
700-	Miscellaneous Cables	Table 9-13 on page 9-19	
800-	Optional Peripherals and Accessories • Optional Peripherals and Access. cont´d	Table 9-16 on page 9-28 Table 9-18 on page 9-30	Printers, Video Recorder, ECG-Module (MAN), etc.
	System Manuals	Table 9-19 on page 9-31	
900- 906- 920- 930-	Probes • 2D curved array Transducers • 2D linear- and phased array Transducers • Real-Time 4D Volume Probes • Real-Time 4D Volume Probes cont´d • CW-Pencil Probes	Table 9-20 on page 9-33 Table 9-21 on page 9-34 Table 9-22 on page 9-35 Table 9-23 on page 9-36 Table 9-24 on page 9-37	
950	Biopsy Needle Guides	Table 9-25 on page 9-39	

Section 9-4
Housing (GW) and additional Console Hardware

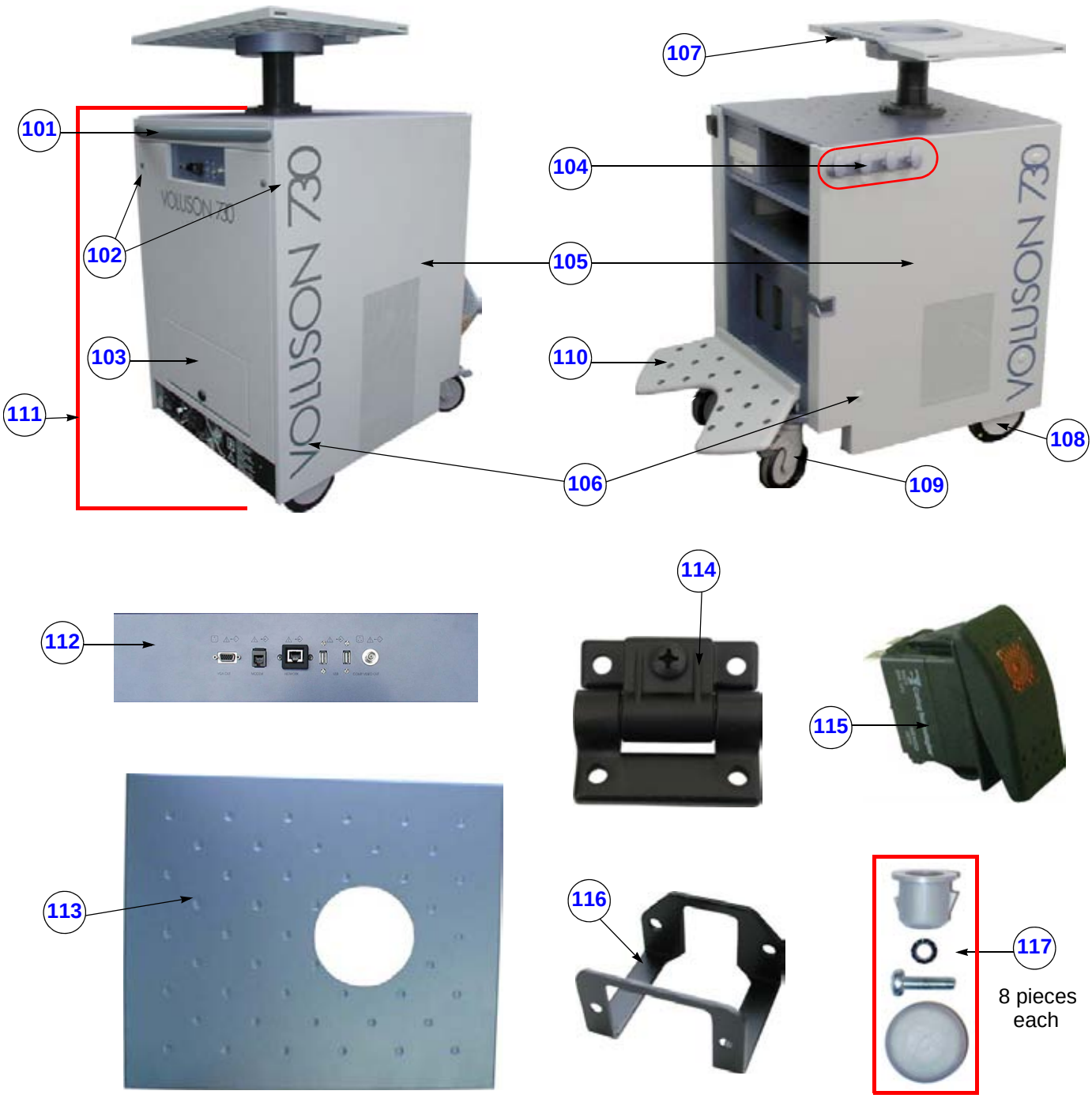


Figure 9-2 Housing (GW) and additional Console Hardware

NOTE: The illustrations may not correspond to the actual product!

Table 9-3 Housing (GW) and additional Console Hardware

Item	Part Name	Part Number	Description	Qty	CRU	FRU
101	Rear Handle for Trolley	KTZ134468	Rear Handle for Trolley	1	Y	1
102	Blind Cap for rear screws	KTZ208109	covers housing screws to make them invisible (1 pcs.)	2	Y	1
103	Rear Metal Cover Plate	KTZ154728	Rear metal cover plate complete	1	N	2
104	Guide for Probe cables	KTZ154736	Guide for Probe cables - **optional** (includes 4 hooks and mounting rail)	1	Y	1
105	Side panel Kit (left an right)	KTZ154735	Side panel Kit (left and right side panel) including guide for probe cables and plastic guide	1	N	2
106	Cap Rubber (8 pcs.)	KTZ154737	Cap Rubber **(set includes 8 pieces)**	8	Y	1
107	Monitor Mounting Plate Voluson® 730Pro/ProV	KTZ134111	Monitor mounting plate	1	N	1
108	Rear Wheel (Ø175 mm x 32)	KTZ211081	Rear wheel non-steerable (1 pcs.)	2	Y	1
109	Steerable Wheel	KTZ211080	Front wheel steerable (1 pcs.)	2	Y	1
110	Foot rest	KTZ134467	Foot rest	1	Y	1
111	GW140 Trolley Voluson® 730Pro/ProV	KTZ154734	Housing with wheels, Power Supply (CPN), Disk Drive Module (GEM), backpanel with connectors (GES) and cables	1	N	2
112	GES8 I/O Connection Panel	KTZ195901	External Rear Panel with electrical Signal- and Supply-Connection-Cables to the systems main unit (internal) Rear-Panel.	1	N	1
113	Top Cover of Trolley	KTZ208119	Top Cover of Trolley	1	N	1
114	Hinge for Foot rest	KTZ220018	Hinge for Foot rest (1 pcs.)	2	N	1
115	Standby Switch	KTZ207125	Standby Switch left below the control panel	1	N	1
116	Pull-out Protection for Mains Power cable	KTZ154717	Pull-out Protection for Mains Power cable (incl. screws)	1	N	1
117	Side Panels Mounting Kit	KTZ280046	“odds and ends” side panels mounting kit incl. sockets, lock washers, screws and rubber caps (8 pieces. each)	-	Y	1

Section 9-5
User Interface (GEU Top Console)

Figure 9-3 User Interface (GEU)

NOTE: The illustrations may not correspond to the actual product!

Table 9-4 User Interface (GEU)

Item	Part Name	Part Number	Description	Qty	CRU	FRU
201	Front Handle User Interface	KTZ209344	Voluson® 730Pro/ProV Front Handle, silver	1	Y	1
202	Probe Holder Kit V730	KTZ209346	right hand Probe holder part, removable	1	Y	1
203	Trackball Kit V730	KTZ208264	generates X-Y-Coordinates of Trackball-Movements like moving a PC-Mouse	1	N	1
204	Trackball top fixation ring	KTZ208256	Trackball for top fixation ring	1	Y	1
205	Caps for Rotation digipots (8 pcs.)	KTZ214798	Caps for Rotation digipots **(set includes 8 pieces with premounted brackets)**	8	Y	1
206	Caps for TGC Slide-pot. (8 pcs.)	KTZ214818	Caps for TGC Slide-pot. **(set includes 8 pieces with premounted brackets)**	8	Y	1
207	Keytop Kit Voluson® 730Pro/ProV	KTZ207558	Keytop Kit Voluson® 730Pro/ProV	1	N	1
208	Alpha-numeric keyboard V730Pro/ ProV (English)	KTZ208217	Alpha-numeric keyboard for Voluson® 730Pro/ProV English *Compatibility:* can be replaced by KTZ300100, if the Hardkey board is also exchanged	1	N	1
209	Alpha-numeric keyboard V730Pro / ProV GEU70 (English)	KTZ300100	Alpha-numeric keyboard for Voluson® 730Pro/ProV English (check if special key cap kit is needed; see: Table 9-12 on page 9-16) *Compatibility:* can replace KTZ208217, if the Hardkey board is also exchanged	1	N	1
210	Gel holder Voluson® 730Pro/ProV	KTZ134521	Gel holder Voluson® 730Pro/ProV	1	Y	1
211	Loudspeaker for Top Console	KTZ208132	Loudspeaker on GEU User Interface (1 pcs.)	2	N	1
212	GEU70 User Interface Voluson® 730Pro/ProV	KTZ154730	English keyboard, trackball, special knobs, and switches (check if special key cap kit is needed; see: Table 9-12 on page 9-16) Pay attention to use lower FRU's like trackball, A/N keyboard, Hardkey board, etc.	1	N	1
213	Top housing of GEU70, painted	KTZ214819	Top housing of GEU70, painted, empty	1	N	1
214	Bottom housing of GEU, painted	KTZ214799	Bottom housing of GEU, painted, without interior	1	N	1
215	Hard key Board for V730Pro / ProV	KTZ208284	Hardkey Board(s) for Voluson® 730Pro/ProV (large board - Part A ; small board - Part B) *Compatibility:* can be replaced by KTZ300098, if the alpha-numeric keyboard is also exchanged	1	N	1
216	Hard key Board for V730Pro / ProV - GEU 70	KTZ300098	Hardkey Board(s) for Voluson® 730Pro/ProV (large board - Part A ; small board - Part B) *Compatibility:* can replace KTZ208284, if the alpha-numeric keyboard is also exchanged	1	N	1
217	Distance Rod for GEU	KTZ14B596	Distance Rod for GEU8	1	N	1
218	Wheel control for V730Pro / ProV	KTZ208257	Wheel control for Voluson® 730Pro/ProV	1	N	1
219	Digipot Set 4 pcs.	KTZ280105	Digipot Set 4 pcs.	1	N	1

Section 9-6
Monitor + Monitor replacement parts

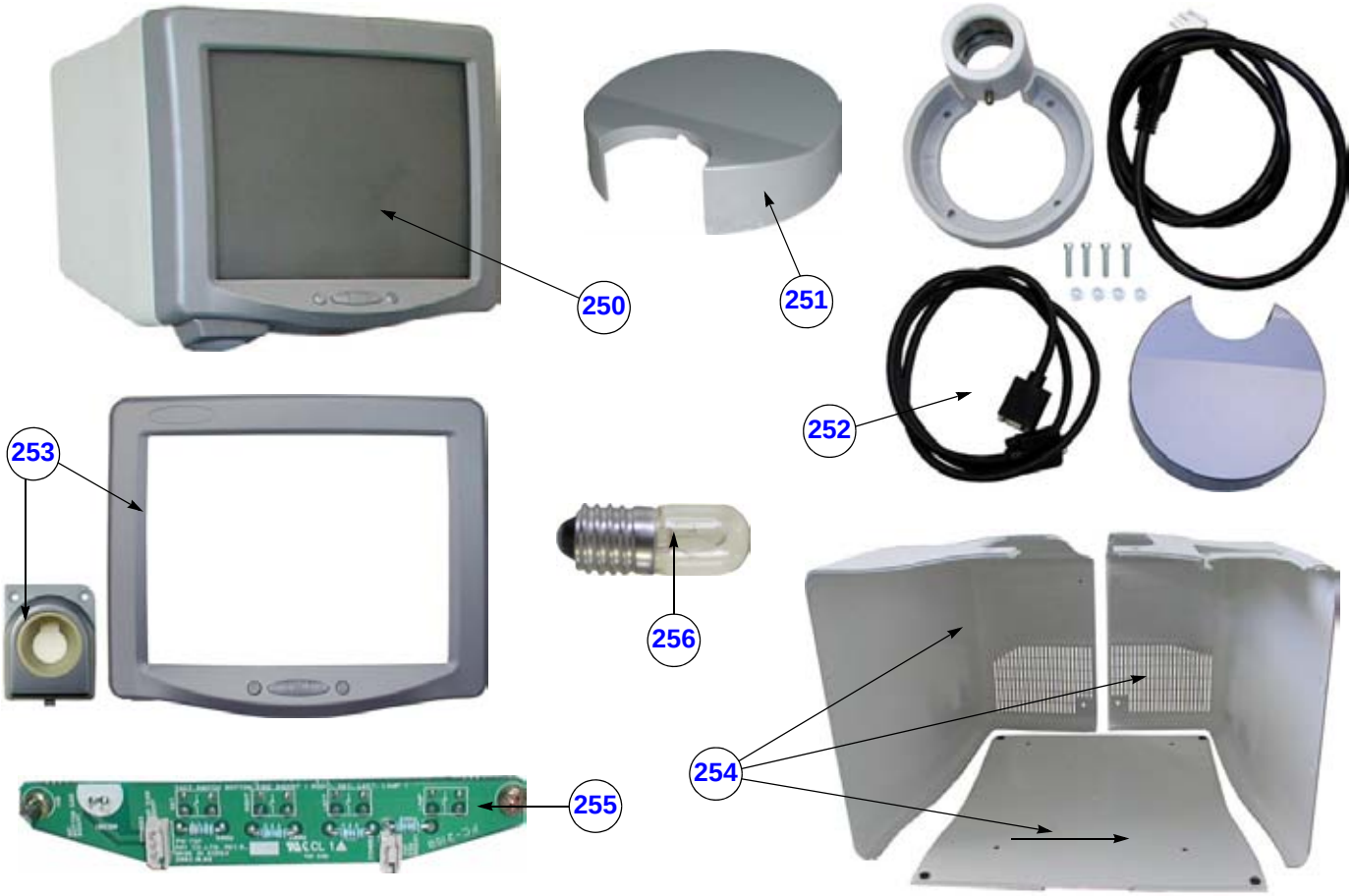


Figure 9-4 Monitor + Monitor replacement parts

NOTE: The illustrations may not correspond to the actual product!

Table 9-5 Monitor + Monitor replacement parts

Item	Part Name	Part Number	Description	Qty	CRU	FRU
250	Color Monitor 15” Painted	KTZ212115	AY-15CUI Color Image Monitor, lacquered	1	N	1
251	Monitor Base Cover	KTZ134474	Monitor Base Cover, silver colored	1	N	1
252	Monitor Mounting Set	KTZ154713	Monitor Mounting Set (fixing part for Monitor)	1	N	1
253	Set Monitor Front Housing	KTZ208445	Set Monitor Front Housing (incl. cover of task lamp)	1	N	1
254	Set Monitor Housing	KTZ208446	Set Monitor Housing (left-, right-, and top cover)	1	N	1
255	Monitor Switch Assembly	2300008	Common part with L5 and L3	1	N	1
256	Task Lamp	2317347	Common part with L5 and L3	1	N	1

Section 9-7
Disk Drives (GEM)

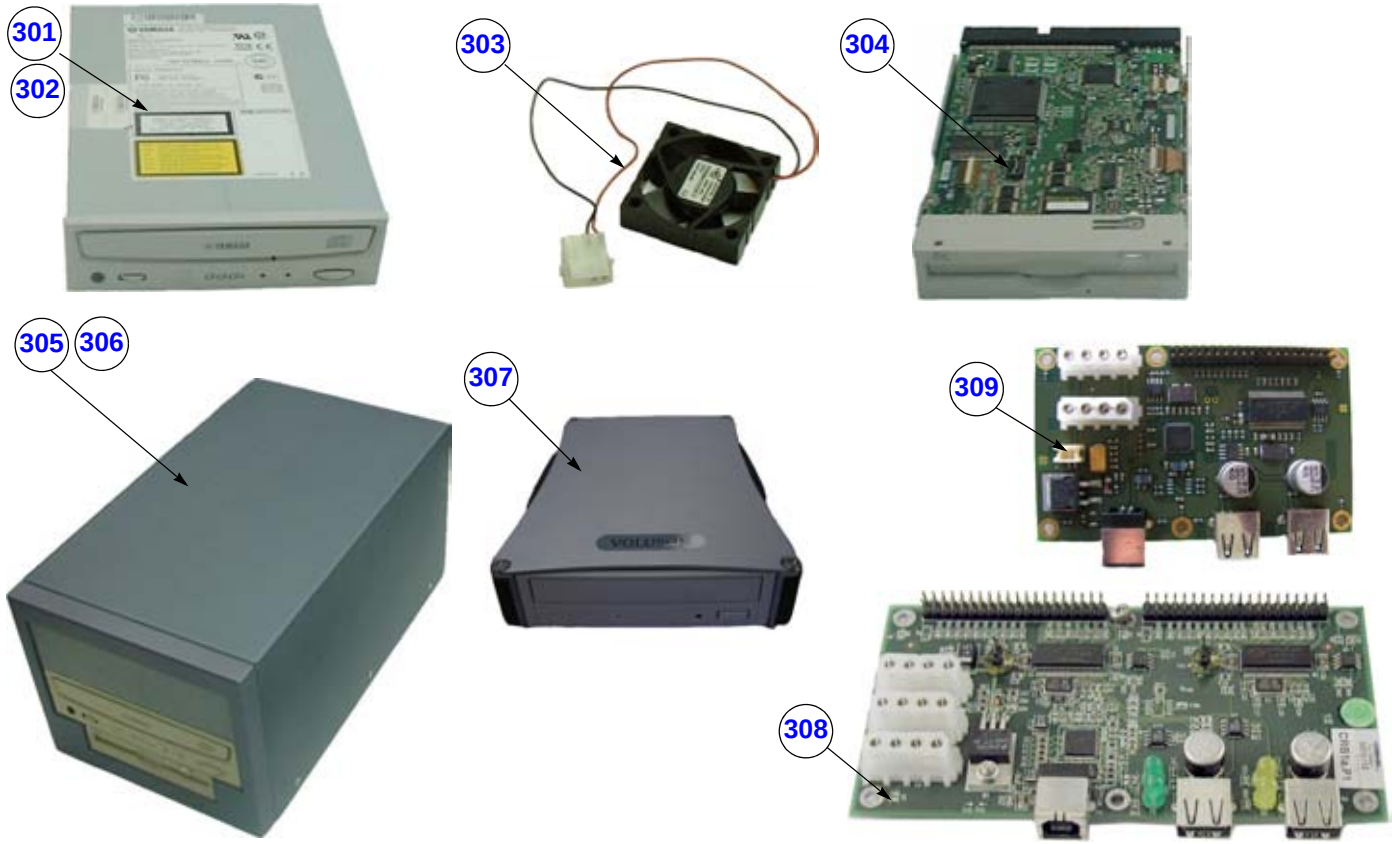


Figure 9-5 Disk Drives (GEM)

NOTE: The illustrations may not correspond to the actual product!

Table 9-6 Disk Drives (GEM)

Item	Part Name	Part Number	Description	Qty	CRU	FRU
301	Disk Drive IDE DVD+(R)W	KTZ207257	DVD+(R)W Writer internal (no own cabinet)	1	N	1
302	DVD Drive TEAC DV-W5000E	KTZ301629	DVD Drive TEAC DV-W5000E	1	N	1
303	Fan axial 62 x 62 x 14 mm	KTZ207602	Fan for Air-Cooling of GEM (SCSI-Drive-Module)	1	N	1
304	Disk Drive IDE MOD 1.3GB internal	KTZ207269	Magneto-Optical-Drive 1.3GB internal (no own cabinet)	1	N	1
305	GEM11-11A MO-Drive + DVD+(R)W	KTZ196000	MO-Drive and DVD+(R)W	1	N	2
306	GEM 21-21A DVD+(R)W	KTZ196001	DVD+(R)W (without MO-Drive)	1	N	2
307	GEM30 DVD+R/RW	KTZ301669	GEM30 DVD+R/RW	1	N	1
308	CRB1c.P1 USB to IDE Converter Board	KTZ195891	CRB1c.P1 USB to IDE Converter Board	1	N	1
309	Board USB2.0 to IDE Converter	KTZ280163	AP039 USB to IDE Converter	1	N	1

Section 9-8
Main Power Module (CPN)

Figure 9-6 Main Power Module (CPN)

NOTE: The illustrations may not correspond to the actual product!

Table 9-7 Main Power Module (CPN)

Item	Part Name	Part Number	Description	Qty	CRU	FRU
401	CPN80-81 Power Supply Module	KTZ207486	CPN80 Power Supply Module	1	N	1
402	CPY80.P1 Power Switch	KTZ209338	Board to switch on and shut down Ultrasound System	1	N	1
403	CCF100.P1 Power Primary Board	KTZ209339	Power Primary Board	1	N	1
404	Mains Power switch and Input connector	KTZ209340	Mains Power Switch and Input Connector	1	N	1
405	Fuses 16 Ampere 6.3 x 32 (10 pcs.)	KTZ209341	used at primary and secondary side (10 pcs.)	3	Y	1
406	Fuses 3.2 Ampere 6.3 x 32 (10 pcs.)	KTZ209342	fuse for auxiliary power output at 110V setting (10 pcs.)	1	Y	1
407	Fuses 1.6 Ampere 6.3 x 32 (10 pcs.)	KTZ209343	fuse for auxiliary power output at 230V setting (10 pcs.)	1	Y	1
408	KVN2 - Fan for Primary Power Supply	KTZ195440	KVN2 - Fan for Primary Power Supply (CPN)	1	N	1
409	Fuse Holder Set (4 pcs.)	KTZ280062	Fuse Hoder Set (4 pcs.)	1	N	1

Section 9-9
Main Board Module (GEZ)

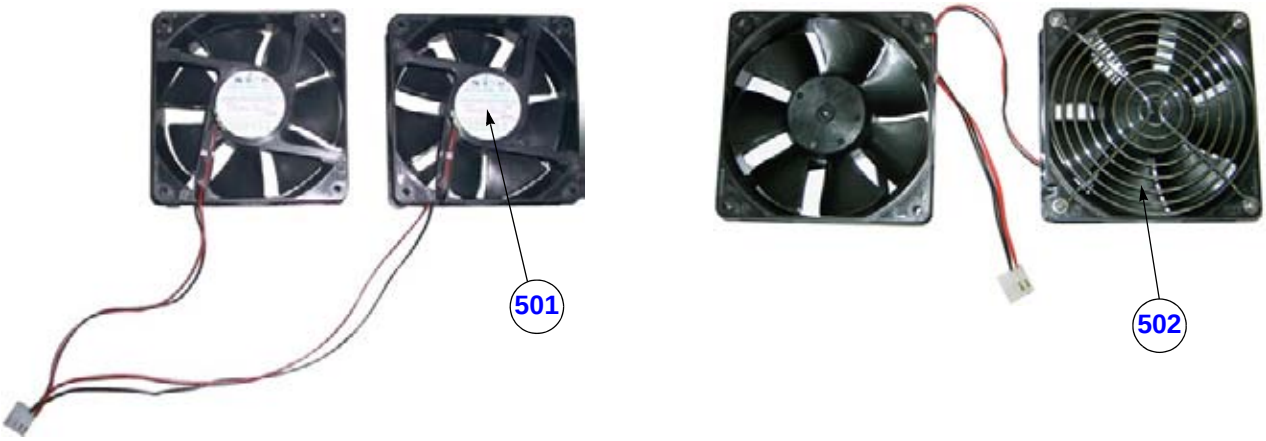


Figure 9-7 Main Board Module (GEZ)

NOTE: The illustrations may not correspond to the actual product!

Table 9-8 Main Board Module (GEZ)

Item	Part Name	Part Number	Description	Qty	CRU	FRU
501	Fan for GEZ-box - FrontEnd (2 fan)	KTZ154738	Fan for GEZ-box - FrontEnd (2 fan)	1	N	1
502	Fan for GEB-PC-box - BackEnd (2 fan)	KTZ154748	Fan for GEB-PC-box - BackEnd (2 fan)	1	N	1

9-9-1 FrontEnd (US-Part)

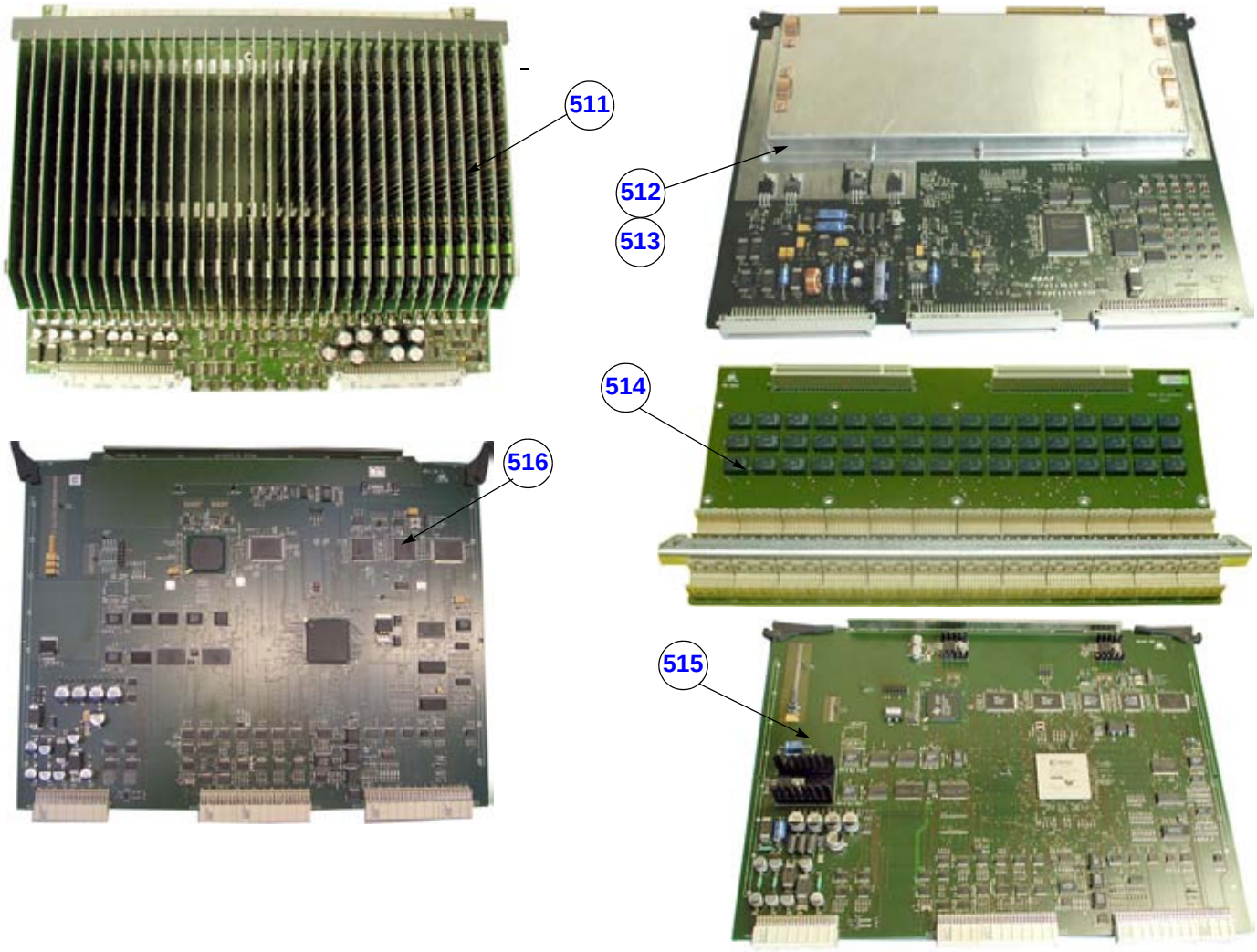


Figure 9-8 FrontEnd (US-Part)

NOTE: The illustrations may not correspond to the actual product!

Table 9-9 FrontEnd (US-Part)

Item	Part Name	Part Number	Description	Qty	CRU	FRU
511	CPR82.P11 Beam former Board	KTZ196024	Beam former Board	1	N	1
512	CRW3.P2 CW Doppler Board	KTZ196086	CW-Doppler Board (can be replaced by CRW4, if **SW 5.2.0** or higher is installed)	1	N	1
513	CRW4.P2 CW Doppler Board	KTZ196306	CW-Doppler Board **SW 5.2.0** or higher is required	1	N	1
514	CPZ50-50a.P3 Cover Board	KTZ195592	electrical signal connection between CPV,CPR and CW-Board; contains Relays for Signal to CW-Board.	1	N	1
515	CRS5.P3 Signal Processing Board	KTZ196074	Signal Processing Board (can replace CRS22)	1	N	1
516	CRS22B.P8 Signal Processing Board	KTZ300428	Signal Processing Board (can replace CRS5) SW 5.0.4 or higher is required	1	N	1

9-9-1 FrontEnd (US-Part) (cont'd)

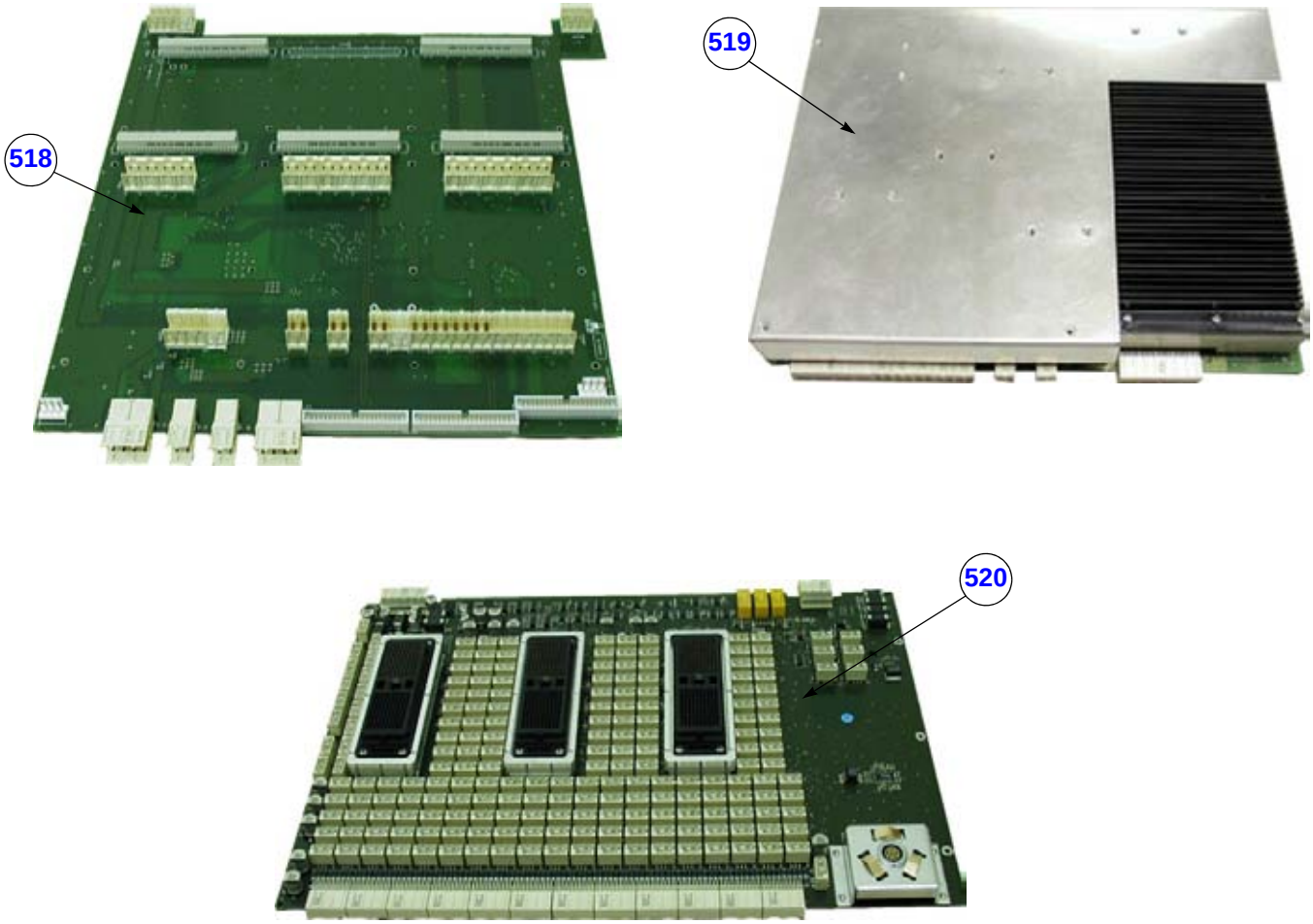


Figure 9-9 FrontEnd (US-Part) cont´d

NOTE: The illustrations may not correspond to the actual product!

Table 9-10 FrontEnd (US-Part) cont´d

Item	Part Name	Part Number	Description	Qty	CRU	FRU
518	CPK95.P8 Motherboard V730	KTZ196053	Electrical Signal- and Supply-Connection for all boards	1	N	1
519	CPP90a.P2 Power Supply Board	KTZ208498	Power Supply Board Output Power: 900 W	1	N	1
520	CPV90a.P6 Module Board	KTZ196063	Probe Connector Board, Module Board	1	N	1

9-9-2 BackEnd Processor (PC-Part)

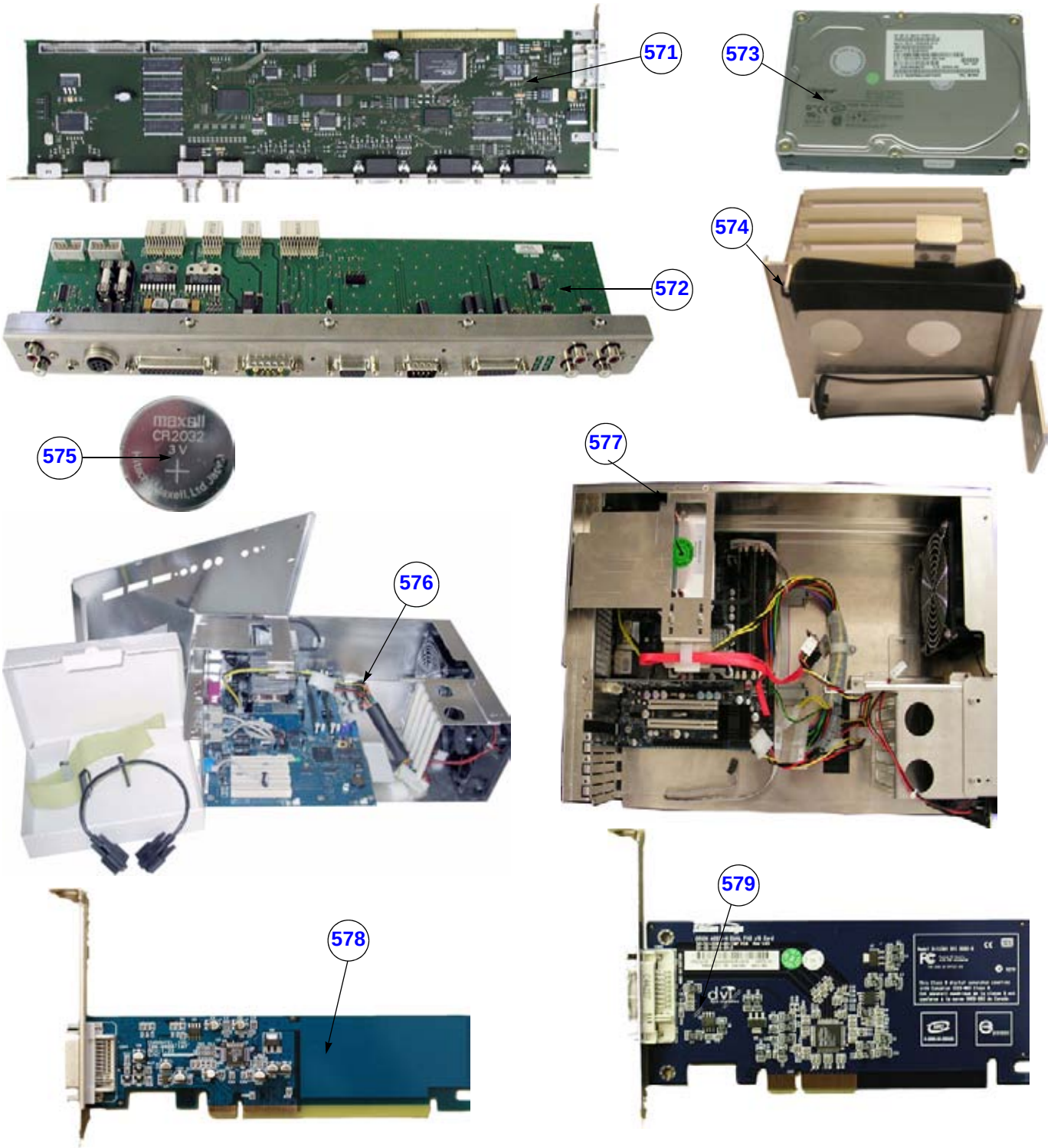


Figure 9-10 Back Processor (PC-Part)

NOTE: The illustrations may not correspond to the actual product!

Table 9-11 Back Processor (PC-Part)

Item	Part Name	Part Number	Description	Qty	CRU	FRU
571	CKV85-86 Video management Board*	KTZ208497	PC-Video converter Board	1	N	1
572	CPE80.P5 Motherboard - Extension	KTZ195902	Motherboard Extension	1	N	1
573	Universal Hard disk for **all** Voluson 730 (V730, V730Expert and V730Pro) systems	KTZ196003	Universal Hard disk (Maxtor or Western digital) System/Boot DVD (see: Table 9-12) is **required**	1	N	1
574	HDD-Holder complete**	KTZ302126	HDD-Holder complete for 160GB HDD and higher	1	N	1
575	Lithium Battery CR2032 (3V)	KTZ208791	Lithium Battery CR2032 (3V) for SBC-Board	1	N	1
576	SBC “Kontron ATX” Kit (BT05, BT08) incl. housing	KTZ208599	Kit contains ATX Motherboard (“Kontron”) Pentium IV chip, CPU cooler, 1Gb RAM, Serial Slot (used only with Kontron types), Serial interface cable, Power Cable Set ATX Fans, USB cable (without HDD and ADD). Can replace “Tyan ATX” types, but system “C:” image **MUST** be loaded! In this case, System/Boot DVD (see: Table 9-12) is **required**	1	N	1
577	SBC “Kontron Flex” Kit (BT05, BT08) incl. housing	KTZ300633	Kit contains ATX Motherboard (“Kontron Flex”) Pentium IV chip, CPU cooler, 1 Gb RAM, SATA cable, SATA to IDE converter, Power cable set ATX, Fans, USB cable (without HDD and ADD). Can replace “Tyan ATX, Kontron ATX, DFI ATX” types, but system “C:” image **MUST** be loaded! In this case, System/Boot DVD (see: Table 9-12) is **required**	1	N	1
578	ADD2-DVI card for “Kontron” SBC-board ***	KTZ208615	ADD2-DVI (Add-On) card for “Kontron” ATX **only** can be replaced by KTZ208588	1	N	1
579	ADD2-DVI card***	KTZ208588	ADD2-DVI (Add-On) card, can be used at **both** PC-board versions (Kontron and Tyan)	1	N	1

***** If the stock of CKV85.P7 VIDEOMANAGEMENT BOARD will be empty, the CKV86.P8 VIDEOMANAGEMENT BOARD will come automatically

***Using of HDD-Holder complete (KTZ302126) is necessary for 160GB HDD and higher.*

******The currently installed Single Board Computer (PC-Board) is shown in the System Setup - System Info page;*** *see: Figure 7-1 on page 7-2, SLOT_CPU:* ***TYAN*** *or* ***KONTRON ATX, DFI ATX or Kontron Flex.***

Section 9-10
Options and Upgrades

Table 9-12 Options and Upgrades

Item	Part Name	Part Number	Description	Qty	CRU	FRU
601	System/Boot DVD (SW 5.4.0, **BT08**) **Note:** Refer to **SN79009**, which is the best source for the latest revision	KTZ280060	bootable DVD for System HDD recovery Contents: SP with newest MS Patches, Linux rescue partition, System C: Image (Windows 2000, Kontron SBC + Tyan SBC supplied), UISApp, Backup, EUM, Database Repair Tool, etc.	1	Y	1
602	System/Boot DVD (SW 5.4.1-Rev.B, **BT05/BT08**) **Note:** Refer to **SN79009**, which is the best source for the latest revision	KTZ280120	bootable DVD for System HDD recovery Contents: SP with newest MS Patches, Linux rescue partition, System C: Image (Windows 2000, Kontron Flex SBC + DFI ATX SBC supplied), UISApp, Backup, EUM, Database Repair Tool, etc., (incl. 3 DVD's)	1	Y	1
603	System/Boot DVD (SW 5.4.2, **BT05/BT08**) **Note:** Refer to **SN79009**, which is the best source for the latest revision	KTZ280129	bootable DVD for System HDD recovery Contents: SP with newest MS Patches, Linux rescue partition, System C: Image (Windows 2000, Kontron Flex SBC + DFI ATX SBC supplied), UISApp, Backup, EUM, Database Repair Tool, etc., (incl. 3 DVD's)	1	Y	1
604	System/Boot DVD (SW 5.4.3, **BT05/BT08**) **Note:** Refer to **SN79009**, which is the best source for the latest revision	KTZ280181	bootable DVD for System HDD recovery Contents: SP with newest MS Patches, Linux rescue partition, System C: Image (Windows 2000, Kontron Flex SBC + DFI ATX SBC supplied), UISApp, Backup, EUM, Database Repair Tool, etc., (incl. 3 DVD's)	1	Y	1
605	System/Boot DVD (SW 5.4.5, **BT05/BT08**) **Note:** Refer to **SN79009**, which is the best source for the latest revision	KTZ280188	bootable DVD for System HDD recovery Contents: SP with newest MS Patches, Linux rescue partition, System C: Image (Windows 2000, Kontron Flex SBC + DFI ATX SBC supplied), UISApp, Backup, EUM, Database Repair Tool, etc., (incl. 3 DVD's)	1	Y	1
606	System/Boot DVD (SW 5.4.6, **BT05/BT08**) **Note:** Refer to **SN79009**, which is the best source for the latest revision	KTZ280198	bootable DVD for System HDD recovery Contents: SP with newest MS Patches, Linux rescue partition, System C: Image (Windows 2000, Kontron Flex SBC + DFI ATX SBC supplied), UISApp, Backup, EUM, Database Repair Tool, etc., (incl. 3 DVD's)	1	Y	1
607	Patch DVD Voluson® 730Pro/ProV (MS08-067)	KTZ280115	Microsoft Vulnerability Patch CD (MS08-067)	1	Y	1
608	Voluson® 730Pro BT05 -> Voluson® 730Pro BT08 Upgrade Kit	H48671DZ	BT08 Upgrade kit (incl. System DVD, Manuals, etc.)	-	N	N
609	Voluson® 730ProV BT05 -> Voluson® 730ProV BT08 Upgrade Kit	H48671E	BT08 Upgrade kit (incl. System DVD, Manuals, etc.)	-	N	N
610	Voluson® 730ProV BT05 -> Voluson® 730Pro BT08 Upgrade Kit	H48671BH	BT08 Upgrade kit (incl. System DVD, Manuals, etc.)	-	N	N
611	Upgrade to new SW Voluson® 730Pro/ProV BT05/08 VERSI	H48681AB	Upgrade kit includes actually BT05/08 SW Version	-	N	N

Table 9-12 Options and Upgrades

Item	Part Name	Part Number	Description	Qty	CRU	FRU
612	Real Time 4D Biopsy	H48651GB	encrypted Software Option string (password) which is specific for each Voluson® 730Pro/ProV system	-	N	N
613	Real Time 4D	H48651GC	encrypted Software Option string (password) which is specific for each Voluson® 730Pro system	-	N	N
614	VOCAL II - Volume Calculation	H48651GD	encrypted Software Option string (password) which is specific for each Voluson® 730Pro system	-	N	N
615	VCI - Volume Contrast Imaging **BT Version:**	H48651GE	encrypted Software Option string (password) which is specific for each Voluson® 730Pro system (**BT05 only**) This feature is standard at BT08 systems (SW 5.4.x).	-	N	N
616	Interface for DICOM 3 standard	H48651GF	encrypted Software Option string (password) which is specific for each Voluson® 730Pro system	-	N	N
617	Interface for DICOM 3 standard	H48651HH	encrypted Software Option string (password) which is specific for each Voluson® 730Pro**V** system	-	N	N
618	SRI - Speckle Reduction Imaging	H48651GH	encrypted Software Option string (password) which is specific for each Voluson® 730Pro system	-	N	N
619	TUI - Tomographic Ultrasound Imaging	H48651GJ	encrypted Software Option string (password) which is specific for each Voluson® 730Pro system	-	N	N
620	STIC	H48651JS	encrypted Software Option string (password) which is specific for each Voluson® 730Pro system	-	N	N
621	SRI II - Speckle Reduction Imaging	H48651NG	encrypted Software Option string (password) which is specific for each Voluson® 730Pro system Software **5.0.3** or higher is required.	-	N	N
622	XTD View (Extended View)	H48651PJ	encrypted Software Option string (password) which is specific for each Voluson® 730Pro system Software **5.2.0** or higher is required.	-	N	N
623	XTD View (Extended View)	H48651PL	encrypted Software Option string (password) which is specific for each Voluson® 730Pro**V** system	-	N	N
624	Fetal Echo Package	H48671EG	encrypted Application Package string (password) which is specific for each Voluson® 730Pro system (**BT08 only**)	-	N	N
625	Gyn Package	H48671EH	encrypted Application Package string (password) which is specific for each Voluson® 730Pro system (**BT08 only**)	-	N	N
626	Breast Package	H48671EJ	encrypted Application Package string (password) which is specific for each Voluson® 730Pro system (**BT08 only**)	-	N	N
627	4D View PC Software	H48651FB (BT05) H48651SZ (BT08)	stand alone PC-Software which can be used to view and work on data produced with Kretztechnik´s Voluson® 730Pro/ProV Ultrasound system	-	N	N
628	CW-Doppler Upgrade Kit external	H48651HE	CW-Doppler Upgrade Kit incl. upgrade instructions	N	N	1
629	Key Cap Kit - Swedish	H48651ED	kit includes special native language keys	N	Y	1
630	Key Cap Kit - Danish	H48651EE	kit includes special native language keys	N	Y	1
631	Key Cap Kit - Norwegian	H48651EF	kit includes special native language keys	N	Y	1

Table 9-12 Options and Upgrades

Item	Part Name	Part Number	Description	Qty	CRU	FRU
632	Key Cap Kit - Finnish	H48651EG	kit includes special native language keys	N	Y	1
633	Key Cap Kit - Spanish	H48651EH	kit includes special native language keys	N	Y	1
634	Key Cap Kit - French	H48651JD	kit includes special native language keys	N	Y	1
635	Key Cap Kit - German	H48651JE	kit includes special native language keys	N	Y	1
636	Key Cap Kit - Italian	H48651JF	kit includes special native language keys	N	Y	1

NOTICE A sales order has to be obtained for item 608 - 636!

Software Options (item 612 - 627): Once the order has been processed, the option string can be either entered by the customer or Applications support.

BT Version: "VCI" is optional at BT05 Voluson® 730Pro systems.
However, at BT08 systems (SW5.4.x installed), or systems that were upgraded to BT08 via upgrade kit, this feature is standard.

A software only update (no new BT-version key) does **NOT** activate this feature.
It remain optional and can be obtained via sales order.

BT Version: Application Packages are only available for Voluson® 730Pro systems with BT08 software (SW 5.4.x).
For more details see: Table 5-2, “Software Options & Application Packages,” on page 5-15.

Section 9-11
Miscellaneous Cables

Table 9-13 Miscellaneous Cables

Item	Part Name	Part Number	Description	Qty	CRU	FRU
701	Adapter Cable PS2 Y-splitter	KTZ208585	Splits the PS2 connector for GEU User Interface (mouse and PC-keyboard	1	Y	1
702	Power Cable for Harddisk	KTZ212401	Power cable for Harddisk 4pin	1	Y	1
703	Cable ATX 12Volt	KTZ212267	HDD power connector to Pentium4 power connector	1	Y	1
704	Cable ATA CKV -> CPK board (40 pin)	KTZ212453	Flat cable(s) from CKV to CPK board, 40pin (1 pcs.)	3	N	1

Table 9-13 Miscellaneous Cables

Item	Part Name	Part Number	Description	Qty	CRU	FRU
705	Cable RS-232 Loop	KTZ208617	Serial Interface Cable (**only** used in combination with "Kontron" SBC-boards)	1	Y	1
706	Power Cable Set ATX	KTZ208591	Power connection cable from CPP-board to Pentium IV SBC (Tyan **only**) and to the Hard disk	1	N	1
		KTZ220417	Power connection cable from CPP-board to Pentium IV SBC and to the Hard disk (can be used at **both** PC-board versions, Kontron and Tyan)		N	
707	Cable Stereo Jack - Chinch	KTZ212074	Cable from PC-Sound-StereoJack to External Rear Panel	1	Y	1

Table 9-13 Miscellaneous Cables

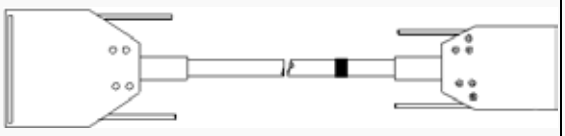
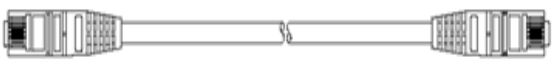
Item	Part Name	Part Number	Description	Qty	CRU	FRU
708	Data Cable HDD ATA66/100	KTZ208147	Data cable for IDE-Hard disk 40pin	1	N	1
709	GES8 I/O Connection Panel	KTZ195901	External Rear Panel with electrical Signal- and Supply-Connection-Cables to the Voluson® 730Pro/ProV Main-Unit (internal) Rear-Panel.	1	N	1
710	KGS10 Cable Power GEM-GEZ	KTZ195464	Electrical Power-Supply for Drives (5V/12V)	1	N	1
711	KUG5 Remote Cable	KTZ195606	VCR -Remote Control Cable 	1	N	1
712	KVS2 Cable Serial Interface	KTZ195717	electrical-Signal-Connection between CRS and SBC (**only** used in combination with “Tyan” SBC-boards)	1	N	1
713	KVX1 Network Cable	KTZ212016	Cable from external rear Panel to the Voluson® 730Pro/ ProV Main-Unit (internal) rear-Panel 1m 	1	N	1

Table 9-13 Miscellaneous Cables

Item	Part Name	Part Number	Description	Qty	CRU	FRU
714	Monitor Power Connection Cable	KTZ212116	Line cord for Supply from Main-Device to Sub-Devices	1	Y	1
715	Power Cord Europe 230V	KTZ212317	Power Cord Europe 230V/240V	1	Y	1
716	Power Cord Japan (Hosp. grade)	KTZ212448	Power Cord Japan Hospital Grade	1	Y	1
717	Power Cord UK	KTZ212441	Power Cord United Kingdom 240V	1	Y	1

Table 9-13 Miscellaneous Cables

Item	Part Name	Part Number	Description	Qty	CRU	FRU
718	Power Cord USA (Hosp.grade)	KTZ212402	Power Cord USA Hospital Grade	1	Y	1
719	Power Cord India	KTZ212452	Power Cord India	1	Y	1
720	Power Cord - China	KTZ212451	Power Cord China	1	Y	1
721	Power Cord - Brazil	KTZ280186	Power Cord Brazil	1	Y	1

Table 9-13 Miscellaneous Cables

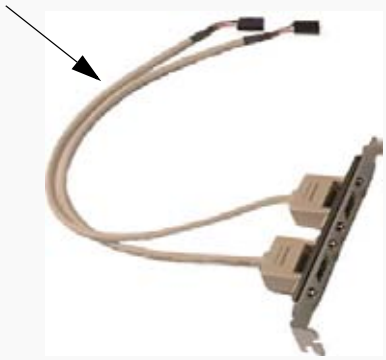
Item	Part Name	Part Number	Description	Qty	CRU	FRU
720	Standby Switch Cable	KTZ195514	Standby Switch Cables	1	Y	1
721	USB to SBC-Board	KTZ207029	**Set contains two parts:** **Not to be used** at Voluson® 730Pro/ProV (BT05, BT08) systems 	1	N	1
			USB for PC-Slot, Connector on Backpanel. Cables are connected to PC-Board. Leads the USB-signals to the PC-Backpanel		N	
722	USB Cable A to B (from GEM to PC-part on GEZ)	KTZ212125	USB Cable from Disk Drive Module (GEM) to connector “USB-GEM” on the PC-part of main board module (GEZ)	1	Y	1

Table 9-13 Miscellaneous Cables

Item	Part Name	Part Number	Description	Qty	CRU	FRU
723	VGA cable HD15-HD15	KTZ212275	VGA cable HD15-HD15	1	Y	1
724	Cable TMDS (Digital Video cable from Add-On DVI Output to CKV)	KTZ208574	Cable TMDS (Digital Video Cable from ADD-On DVI Output to CKV)	1	N	1
725	USB -> RS-232 Adapter (Modem Data Cable)	KTZ212114	USB -> -RS-232 Adapter Data Cable for (optional) Global Modem	1	Y	1
726	Power Connection Cable	KTZ212032	Power Connection Cable	1	Y	1

Section 9-12
Optional Peripherals and Accessories

Table 9-14 below outlines the optional peripherals and accessories described in the sub-sections

Table 9-14 Optional Peripherals and Accessories - Replacement Parts

Sub-section	Description	Page Number
9-12-1	Recording Tools	9-26
9-12-2	Printers	9-27
9-12-3	Optional Equipment	9-29

9-12-1 Recording Tools

Figure 9-11 Optional Peripherals and Accessories - Recording Tools

NOTE: The illustrations may not correspond to the actual product!

Table 9-15 Optional Peripherals and Accessories - Recording Tools

Item	Part Name	Part Number	Description	Qty	CRU	FRU
800	S-VHS Medical Grade VCR - NTSC (Mitsubishi VCR HS-MD3000U)	KTZ211368 (H46801D)	NTSC (Video Converter required)	-	N	1
801	S-VHS Medical Grade VCR - PAL (Mitsubishi VCR HS-MD3000E)	KTZ211369 (H46801C)	PAL (Video Converter required)	-	N	1
802	DVD Recorder - PAL/NTSC (Sony DVO-1000MD)	KTZ154759 (H48651ND)	DVD Recorder (PAL/NTSC) (Video Converter required)	-	N	1

9-12-2 Printers

Figure 9-12 Optional Peripherals and Accessories - Printers

NOTE: The illustrations may not correspond to the actual product!

Table 9-16 Optional Peripherals and Accessories - Printers

Item	Part Name	Part Number	Description	Qty	CRU	FRU
803	Sony B/W Video Printer UP-895MD (CE)	KTZ211332 (H46801A)	Analog B/W Video Printer NTSC/PAL	-	N	1
804	PPP55 Connection Set	KTZ195643	Connection Set UP-895MD	-	N	1
805	Digital B/W Video Printer (Sony UP-D897)	KTZ220507 (H48651ML)	Digital Black&White Video Printer (USB-Port)	-	N	1
806	Mitsubishi B/W Printer P95D	KTZ302617 (H48681TH)	Mitsubishi B/W Printer P95D	-	N	1
807	Sony Digital Color Printer UP-D23MD	KTZ211373 (H46831B)	USB-Port	-	N	1
808	PZP60 Connection Set	KTZ195776	Connection Set UP-D23MD	-	N	1
809	Digital Color Printer (Sony UP-D25MD)	KTZ211373 (H46831B)	Digital Color Printer (USB-Port)	-	N	1
810	Mitsubishi Color Printer CP30D	KTZ302616 (H48681TJ)	Mitsubishi Color Printer CP30D	-	N	1
811	Line Printer (Bluetooth) HP 5600 Series or Olivetti Job Jet 210 (license product of HP)	KTZ211503 (H46631L)	(Bluetooth Connection Set KTZ196002 is required) replaced by KTZ220510	-	N	1
812	Line Printer Bluetooth (HP 5940)	KTZ220510 (H48651WE)	Line Printer Bluetooth (USB-Port) **without** cartridge (Bluetooth Connection Set KTZ196002 is required) can be replaced by Canon printer KTZ300182	-	N	1
813	Line Printer Bluetooth (e.g., HP Officejet H470)	KTZ300182 (H48661MT)	Line Printer Bluetooth incl. Ink, Bluetooth Adapters + power cable US and EU	-	N	1
814	Line Printer Bluetooth (Canon Pixma MP600/MP610)		Line Printer Bluetooth incl. Ink, Bluetooth Adapters + power cable US and EU (replaces HP printer KTZ220510)	-	N	1
815	Line Printer Bluetooth (Canon Pixma MP550)		Line Printer Bluetooth incl. Ink, Bluetooth Adapters + power cable US and EU (replaces Canon MP600/MP610)	-	N	1
816	Bluetooth Connection Set	KTZ196002 (H46631M)	Bluetooth Connection Set (HP 5600 Series and Olivetti Job Jet 210 **only**)	-	N	1
817	Line Printer Destination Set	KTZ280057 (H48661MW)	Line printer power cable set for US, EU and ROW (rest of world)	-	N	1
818	PRR50 Connection Set	KTZ195492	Connection Set for VCR without remote control	-	N	1
819	Canon Driver Kit	KTZ280123	Driver-DVD for easy installation Bluetooth Canon Pixma (808)	-	N	1

BT Version: The Digital B/W Video Printer “UP-D897” is only applicable at systems with BT08 software (SW 5.4.x).

9-12-3 Optional Equipment

Figure 9-13 Optional Peripherals and Accessories

NOTE: The illustrations may not correspond to the actual product!

Table 9-17 Optional Peripherals and Accessories cont´d

Item	Part Name	Part Number	Description	Qty	CRU	FRU
820	19” LCD Secondary Monitor	KTZ220525	19” LCD Secondary “Patient” Monitor **without** Wall Mount kit and Isolation Transformer	-	Y	2
821	Isolation Transformer kit	H48671WN	Isolation Transformer kit for Secondary Monitor incl. power cord set for US, EU and ROW (rest of world), monitor power cable, fuses, documentation, etc.	-	Y	-
822	Isolation Transformer	KTZ220714	Isolation Transformer **without** cables, etc.	-	Y	1
823	Fuses for Isolation Transformer	KTZ196333	Fuses for Isolation Transformer (2AT, 4AT; 10 pcs. each = 20)	-	Y	1
824	Wall Mount kit for 19” LCD Secondary Monitor	KTZ220526	Wall Mount kit for 19” LCD Secondary Monitor	-	N	2
825	19” LCD Secondary Monitor kit	H48671EM	19” LCD Secondary “Patient” Monitor incl. Wall Mount kit, Isolation Transformer, cables, etc.	-	Y	-

9-12-3 Optional Equipment (cont'd)

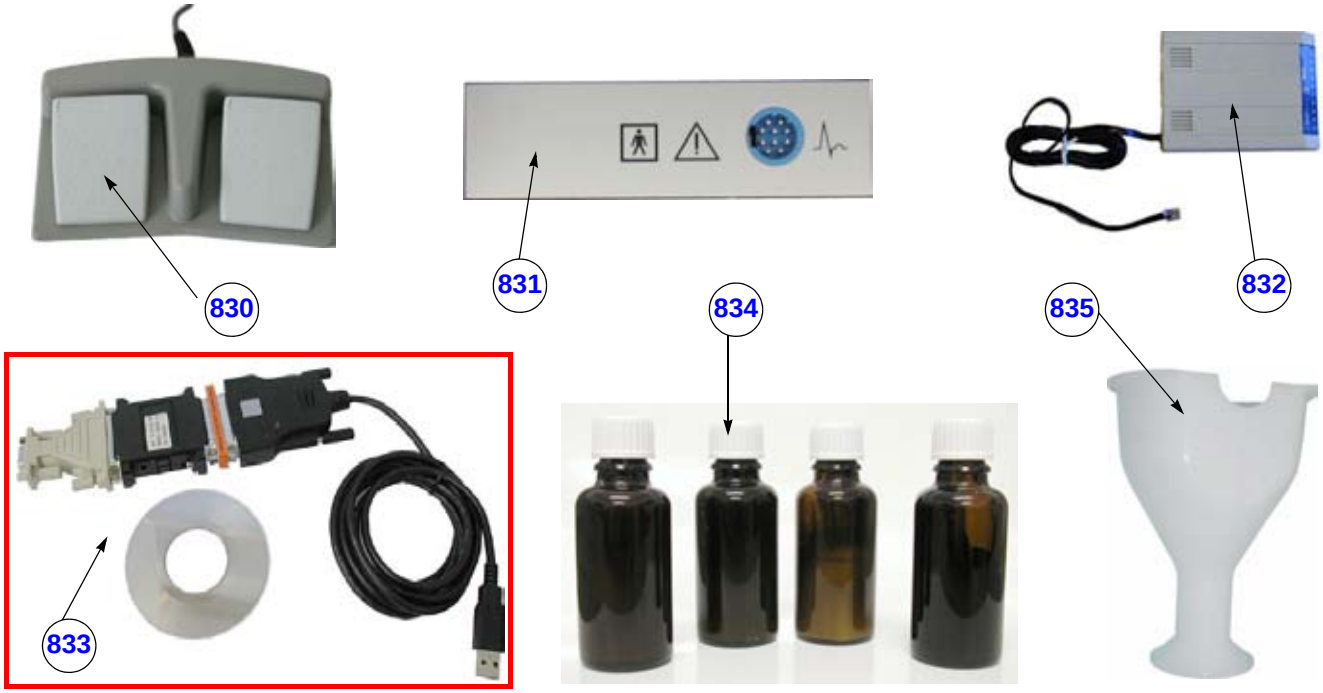


Figure 9-14 Optional Peripherals and Accessories cont´d

NOTE: The illustrations may not correspond to the actual product!

Table 9-18 Optional Peripherals and Accessories cont´d

Item	Part Name	Part Number	Description	Qty	CRU	FRU
830	Foot switch (MFT7)	KTZ195446 (H46681D)	Foot switch	-	Y	1
831	ECG-preamplifier (MAN 6)	KTZ154644 (H46681H)	consists of ECG-preamplifier and patient connection cable	-	N	1
832	Global Modem (Analog)	2245794 (H48651HF)	Global Modem analog (Common Part with L9 and V7) use modem cable: KTZ212114 + KTZ212032	-	N	1
833	USB-RS232 Connection kit PRY	KTZ195858 (H46681S)	Converter from USB to RS-232 Serial Port (Connection Module - Report data)	-	N	1
834	Touch-up Paint Set (gray-blue)	KTZ154680	contains blue, dark-gray, bright-gray and black 4x 2cl bottles incl. brush	-	N	1
835	RIC-Holder	KTZ225469	Probe holder used for Real-time 4D endocavity probes (RIC) during disinfection process	-	Y	1
	DVD+RW Disk blank	KTZ196204 (H48641D)	DVD+RW Disk (re-writable)	-	Y	1
	MO Disk Media 1.3GB	KTZ207077 (H46681M)	MO-Disk Media (Standard)	-	Y	1

Section 9-13
System Manuals

Table 9-19 System Manuals

Item	Part Name	Part Number	Kretz #
	Voluson® 730Pro/ProV (BT05, BT08) Service Manual	KTI105991	KTI105991
	System User Manuals		
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), English	H48651FR	KTI105974
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), German	H48651FS	KTI105978
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Spanish	H48651FT	KTI105979
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Portuguese	H48651FW	KTI105980
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Italian	H48651FY	KTI105981
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), French	H48651FZ	KTI105982
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Chinese	H48651G	KTI105983
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Danish	H48651HX	KTI106011
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Dutch	H48651HY	KTI106012
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Finnish	H48651HZ	KTI106013
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Greek	H48651J	KTI106014
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Norwegian	H48651JP	KTI106015
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Polish	H48651JA	KTI106016
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Russian	H48651JB	KTI106017
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Swedish	H48651JC	KTI106018
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Turkish	H48651KA	KTI106021
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Czech	H48661HW	KTI106079
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Hungarian	H48661HY	KTI106080
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Latvian	H48661HZ	KTI106081
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Lithuanian	H48661J	KTI106082
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Estonian	H48661JA	KTI106083
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Slovakian	H48661JB	KTI106084
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Bulgarian	H48661LM	KTD100703
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Romanian	H48661JC	KTI106085
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Serbian	H48671LM	KTD101013
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Croatian	H48671LP	KTD101014
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Indonesian	H48681TD	-
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Korean	H48661ED	KTI106117

Table 9-19 System Manuals

Item	Part Name	Part Number	Kretz #
	Basic User Manual, Voluson® 730Pro/ProV (BT05, BT08), Portuguese (European)	H48671EA	KTD100706
	Advanced Reference Manual Voluson® 730Pro/ProV (BT05, BT08), English	H48651FE	KTI106019

Section 9-14
Probes

9-14-1 2D-Probes

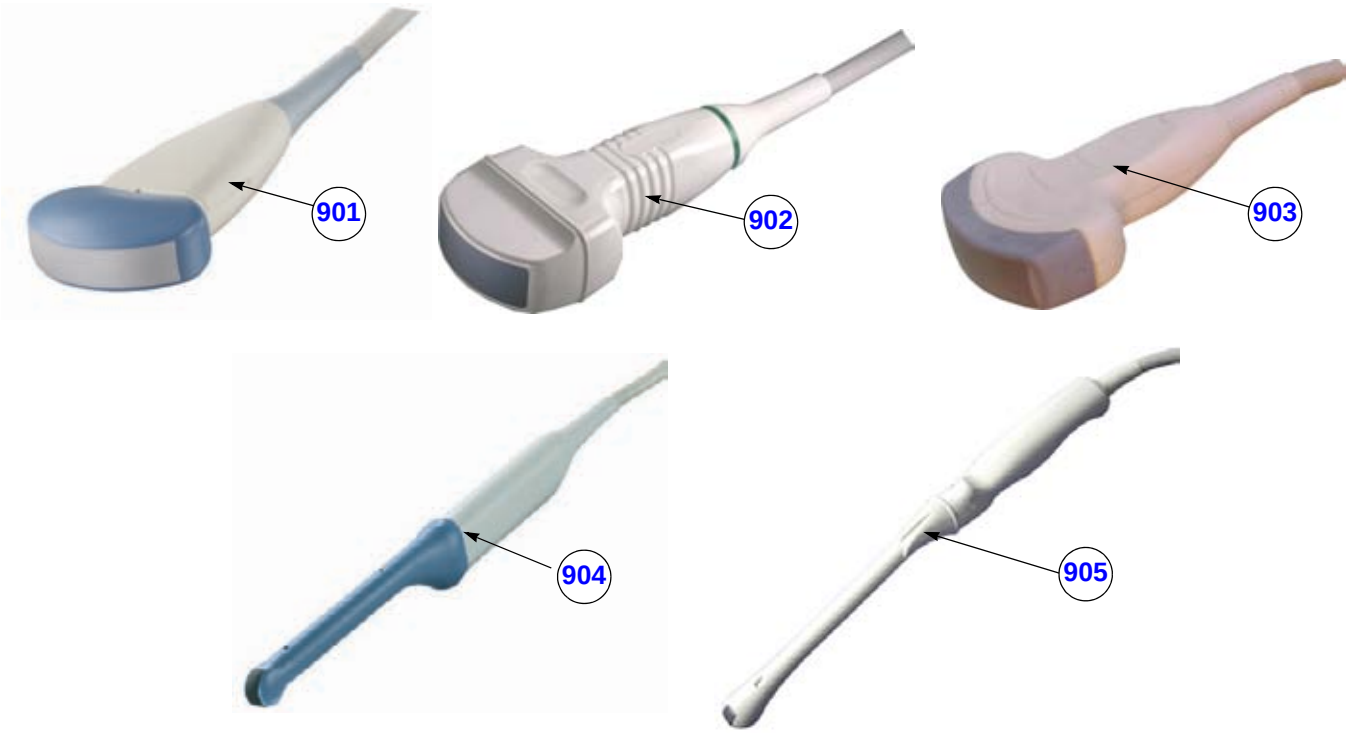


Figure 9-15 2D curved array Transducers

NOTE: The illustrations may not correspond to the actual product!

Table 9-20 2D curved array Transducers

Item	Part Name	Part Number	Description	Qty	CRU	FRU
901	AB2-7	KTZ195757 (H46701T)	electronic broadband curved array transducer, frequency range of 2-7 MHz Applications: Abdominal, Obstetrics, Gynecology, Urology, Pediatrics	-	Y	1
902	AC2-5	KTZ195784 (H46701U)	electronic broadband curved array transducer, frequency range of 2-5 MHz Applications: Abdominal, Obstetrics, Gynecology, Pediatrics	-	Y	1
903	4C-A	KTZ156952 (H46701AA)	electronic broadband curved array transducer, frequency range of 2-5 MHz Applications: Abdominal, Obstetrics, Gynecology	-	Y	1
904	IC5-9	KTZ195386 (H46701F)	electronic endocavity broadband curved array transducer with a frequency range of 5-9 MHz and a field-of-view of max. 150° Applications: Obstetrics, Gynecology, Urology	-	Y	1
905	IC5-9H	5118195 (H40422LL)	electronic endocavity broadband curved array transducer with a frequency range of 5-9 MHz and a field-of-view of max. 150° Applications: Obstetrics, Gynecology, Urology	-	Y	1

9-14-1 2D-Probes (cont'd)

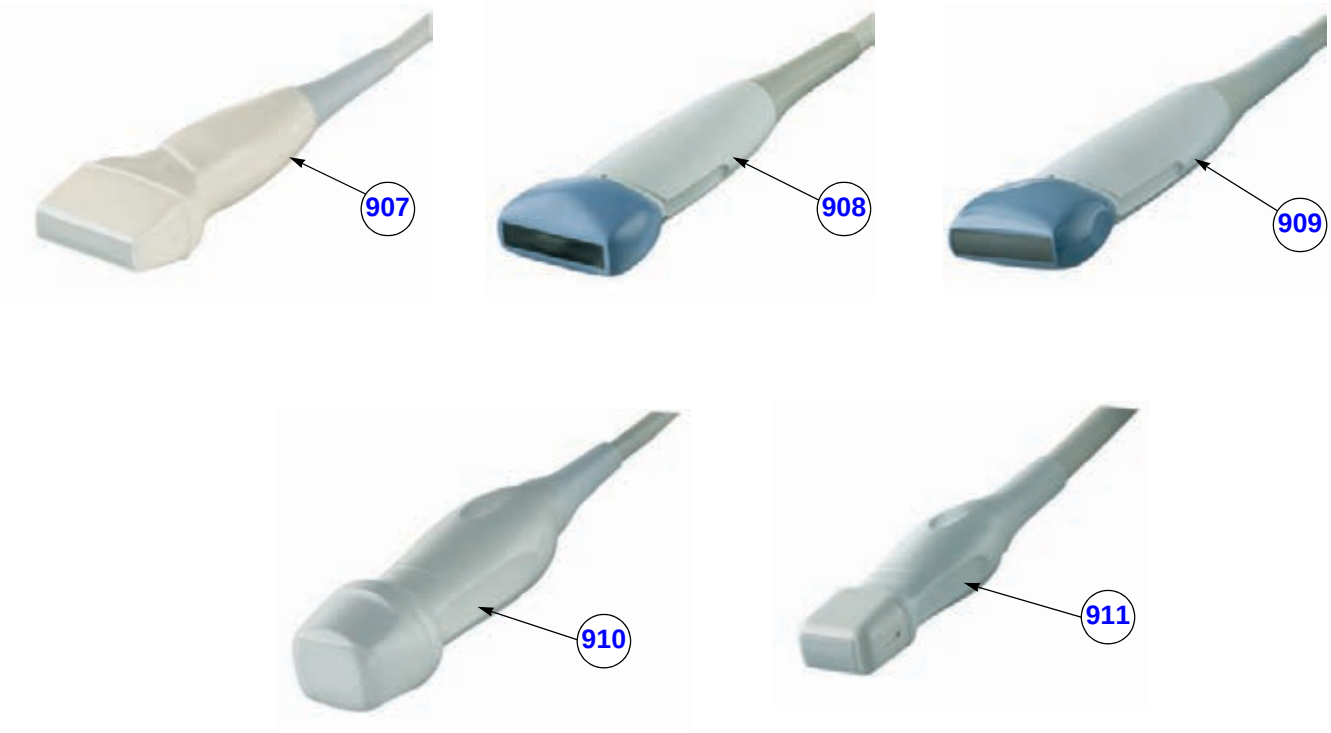


Figure 9-16 2D linear- and phased array Transducers

NOTE: The illustrations may not correspond to the actual product!

Table 9-21 2D linear- and phased array Transducers

Item	Part Name	Part Number	Description	Qty	CRU	FRU
907	SP4-10	KTZ195530 (H46701A)	electronic broadband linear array transducer, frequency range of 4-10 MHz, electronically steerable Applications: Small Parts, Peripheral Vascular, Pediatrics, Orthopedics	-	Y	1
908	SP6-12	KTZ195362 (H46701B)	electronic broadband linear array transducer, frequency range of 6-12 MHz, electronically steerable Applications: Small Parts, Peripheral Vascular, Pediatrics, Orthopedics	-	Y	1
909	SP10-16	KTZ195531 (H46701C)	electronic broadband linear array transducer, frequency range of 10-16 MHz, electronically steerable Applications: Small Parts, Peripheral Vascular, Pediatrics, Orthopedics	-	Y	1
910	PA2-5P	KTZ195773 (H46701V)	electronic broadband phased array transducer, frequency range of 2-5 MHz Applications: Abdominal, Cardiology, Transcranial	-	Y	1
911	PA6-8	KTZ195532 (H46701J)	electronic broadband phased array transducer, frequency range of 6-8 MHz Applications: Cardiology, Pediatrics/Neonatology	-	Y	1

9-14-2 Real-Time 4D Volume Probes

Figure 9-17 Real-Time 4D Volume Probes

NOTE: The illustrations may not correspond to the actual product!

Table 9-22 Real-Time 4D Volume Probes

Item	Part Name	Part Number	Description	Qty	CRU	FRU
921	RAB2-5	KTZ156736 (H46701M)	Real-time 4D broadband electronic curved-array transducer with a frequency range of 2-5MHz. Applications: Abdominal, Obstetrics, Gynecology, Interventional Radiology	-	Y	1
922	RAB4-8P	KTZ156767 (H46701N)	Real-time 4D broadband electronic curved-array transducer with a frequency range of 4-8MHz. Applications: Abdominal, OB, Gyn, Pediatrics, Interventional Radiology	-	Y	1
923	RAB2-5L	KTZ156845 (H48621X)	Real-time 4D broadband electronic curved-array transducer with a frequency range of 2-5MHz. Applications: Abdominal, Obstetrics, Gynecology, Interventional Radiology Voluson® 730Pro**V**: Software **5.1.0** or higher is required.	-	Y	1
924	RAB4-8L	KTZ156846 (H48621Z)	Real-time 4D broadband electronic curved-array transducer with a frequency range of 4-8MHz. Applications: Abdominal, OB, Gyn, Pediatrics, Interventional Radiology Voluson® 730Pro**V**: Software **5.1.0** or higher is required.	-	Y	1
925	RSP5-12	KTZ195763 (H46701W)	Real-time 4D broadband electronic linear array transducer with a frequency range of 5-12MHz and a scan width of 40 mm. Applications: Small Parts, Periph.Vascular, Pediatrics, Urology, Orthopedics	-	Y	1
926	RSP6-16	KTZ156965 (H46701AB)	Real-time 4D broadband electronic linear array transducer with a frequency range of 6-16 MHz and a scan width of 40 mm. Applications: Small Parts, Periph.Vascular, Pediatrics, Urology, Orthopedics	-	Y	1

9-14-2 Real-Time 4D Volume Probes (cont'd)

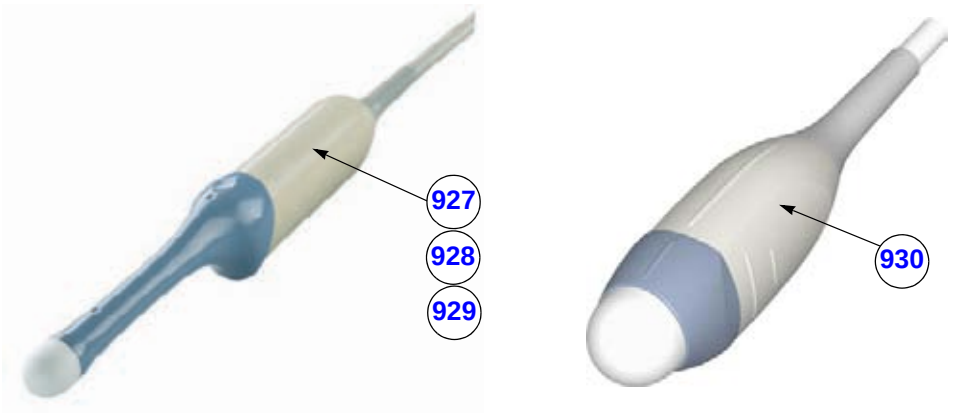


Figure 9-18 Real-Time 4D Volume Probes

NOTE: The illustrations may not correspond to the actual product!

Table 9-23 Real-Time 4D Volume Probes

Item	Part Name	Part Number	Description	Qty	CRU	FRU
927	RIC5-9	KTZ195242 (H46701R)	Real-time 4D endocavity broadband electronic curved array transducer with a frequency range of 5-9MHz. Applications: Gynecology/Fertility, Obstetrics, Urology		Y	1
928	RIC5-9H	KTZ156920 (H48651DA)	Real-time 4D broadband electronic curved-array transducer with a frequency range of 4-8MHz. Applications: Abdominal, OB, Gyn, Pediatrics, Interventional Radiology		Y	1
929	RIC5-9W	KTZ157094 (H48661HJ)	Real-time 4D broadband electronic "Wide Angle" curved-array transducer with a frequency range of 5-9MHz. Applications: Gynecology/Fertility, Obstetrics, Urology **Note:** This probe is only applicable at systems with BT08 software (SW5.4.x)	-	Y	1
930	RNA5-9*	KTZ156936 (H48651DB)	Real-time 4D neonatal broadband electronic curved array transducer with a frequency range of 5-9MHz. Applications: Obstetrics, Pediatrics/Neonatology, Cardiology, Small Parts		Y	1

NOTICE * NOT applicable on the Voluson® 730Pro V.

BT Version: The probe "RIC5-9W" is only applicable at systems with BT08 software (SW 5.4.x).

9-14-3 CW-Pencil Probes

Figure 9-19 CW- Pencil Probes

NOTE: The illustrations may not correspond to the actual product!

Table 9-24 CW- Pencil Probes

Item	Part Name	Part Number	Description	Qty	CRU	FRU
931	PCW4.0	KTZ195540 (H46701L)	single element Continuous Wave (CW) Doppler pencil probe with a nominal operating frequency of 4.0 MHz (no B-image) Applications: Cardiology, Pediatrics			1
932	SCW2.0	KTZ195538 (H46701K)	single element Continuous Wave (CW) Doppler pencil probe with a nominal operating frequency of 2.0 MHz (no B-image) Applications: Cardiology (suprasternal)			1

Section 9-15
Biopsy Needle Guides

Figure 9-20 Biopsy Needle Guides

Table 9-25 Biopsy Needle Guides

Item	Part Name	Part Number	Description	Qty	CRU	FRU
950	***** (disposable)	E8385MJ	disposable Biopsy needle guide for probe IC5-9H needle diameter: < 1.65 mm	-	N	N
951	***** (reusable)	H40412LN	reusable Biopsy needle guide for probe IC5-9H needle diameter: < 1.65 mm	-	N	N
952	PEC42	H46721F	reusable Biopsy needle guide for probe IC5-9 needle diameter: < 1.8 mm	-	N	N
953	PEC63	H46721R	reusable Biopsy needle guide for probe RIC5-9 / RIC5-9H needle diameter: < 1.8 mm	-	N	N
954	PEC64	H46721B	reusable Biopsy needle guide for probe SP6-12 needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	N	N
955	PEC65	H46721M	reusable Biopsy needle guide for probe RAB2-5 / RAB4-8P needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	N	N
956	PEC68	H46721P	reusable Biopsy needle guide for probe RSP5-12 / RSP6-16 needle diameter: < 1 mm, 1.4 mm, 2.2 mm (can be replaced by PEC75)	-	N	N
957	PEC71	H46721D	reusable Biopsy needle guide for probe AB2-7 needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	N	N
958	PEC74	H48621Y	reusable Biopsy needle guide for probe RAB2-5L / RAB4-8L needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	N	N
959	RAB Single-angle bracket	H46701AE	Non Sterile Single Angle Bracket needle guide for probe RAB2-5-L/RAB4-8-L needle diameter: > 0.6 mm - < 2.1 mm	-	N	N
960	PEC75	H46721W	reusable Biopsy needle guide for probe RSP5-12 / RSP6-16 needle diameter: < 1 mm, 1.4 mm, 2.2 mm (can replace PEC68)	-	N	N
961	RSP Single-angle bracket	H46701AD	Non Sterile Single Angle Bracket needle guide for probe RSP5-12 / RSP6-16 needle diameter: > 0.6 mm - < 2.1 mm	--	N	N
962	PEC76	H48651DG	reusable Biopsy needle guide for probe RNA5-9 needle diameter: < 1 mm, 1.4 mm, 2.2 mm	-	N	N
963	RNA Single-angle bracket	H46701AF	Non Sterile Single Angle Bracket needle guide for probe RNA5-9 needle diameter: > 0.6 mm - < 2.1 mm	-	N	N
964	3.5C Biopsy Kit	E8385MG	3.5C Biopsy Starter Kit for probe AC2-5 needle diameter: > 0.6 mm - < 2.1 mm	-	N	N
965	4C Multi-angle bracket	E8385NA	Non Sterile Multi Angle Bracket needle guide starter kit for probe 4C-A needle diameter: > 0.6 mm - < 2.1 mm	-	N	N

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Chapter 10
Care & Maintenance

Section 10-1
Overview

10-1-1 Periodic Maintenance Inspections

It has been determined by engineering that your Voluson® 730Pro/ProV system does not have any high wear components that fail with use, therefore no Periodic Maintenance Inspections are mandatory. Some Customers Quality Assurance Programs may require additional tasks and or inspections to be performed at periods of frequency different from those listed in this manual.

10-1-2 Purpose of Chapter 10

This chapter describes **Care & Maintenance** on the Voluson® 730Pro/ProV system and its peripherals. These procedures are intended to **maintain the quality** of the **systems performance**.
Read this chapter completely and familiarize yourself with the procedures before performing a task.

Table 10-1 Contents in Chapter 10

Section	Description	Page Number
10-1	Overview	10-1
10-2	Why do Maintenance	10-2
10-3	Maintenance Task Schedule	10-2
10-4	Tools Required	10-5
10-5	System Maintenance	10-6
10-6	Using a Phantom	10-12
10-7	Electrical Safety Tests	10-12
10-8	When There's Too Much Leakage Current...	10-22
10-9	Ultrasound Equipment Quality Check (EQC)	10-23
10-10	Electrical Safety Test Form	10-24

CAUTION **Practice good ESD prevention. Wear an anti–static strap when handling electronic parts and even when disconnecting/connecting cables.**

DANGER **THERE ARE SEVERAL PLACES ON THE BACKPLANE, THE AC DISTRIBUTION, AND DC DISTRIBUTION THAT ARE DANGEROUS. BE SURE TO DISCONNECT THE SYSTEM POWER PLUG AND SWITCH OFF THE MAIN CIRCUIT BREAKER (F1) BEFORE YOU REMOVE ANY PARTS. BE CAUTIOUS WHENEVER POWER IS STILL ON AND COVERS ARE REMOVED.**

CAUTION **Do not pull out or insert circuit boards while power is ON.**

CAUTION **Do not operate this unit unless all board covers and frame panels are securely in place. System performance and cooling require this.**

Section 10-2
Why do Maintenance

10-2-1 Keeping Records

It is good business practice that ultrasound facilities maintain records of quality checks and corrective maintenance. The Ultrasound Equipment Quality Check form provides the customer with documentation that the ultrasound scanner is maintained on a periodic basis.

A copy of the Ultrasound Equipment Quality Check (EQC) form (see: page 10-23) should be kept in the same room or near the scanner.

10-2-2 Quality Assurance

In order to gain accreditation from organizations such as the American College of Radiology (USA), it is the customer's responsibility to have a quality assurance program in place for each scanner. The program must be directed by a medical physicists, the supervising radiologist/physician or appropriate designer.

Routine quality control testing must occur regularly. The same tests are performed during each period so that changes can be monitored over time and effective corrective action can be taken.

Testing results, corrective action and the effects of corrective action must be documented and maintained on the site.

Your GE service representative can help you with establishing, performing and maintaining records for a quality assurance program. Please contact us for coverage information and/or price for service.

Section 10-3
Maintenance Task Schedule

10-3-1 How often should care & maintenance tasks be performed?

The Customer Care Schedule (see: page 10-3) specifies how often your Voluson® 730Pro/ProV should be serviced and outlines items requiring special attention.

NOTE: It is the customer's responsibility to ensure the Voluson® 730Pro/ProV care & maintenance is performed as scheduled in order to retain its high level of safety, dependability and performance.

Your GE Service Representative has an in-depth knowlegde of your Voluson® 730Pro/ProV ultrasound scanning system and can best provide competent, efficient service.
Please contact us for coverage information and/or price for service.

The service procedures and recommended intervals shown in the Care & Maintenance Task Schedule assumes that you use your Voluson® 730Pro/ProV for an average patient load (10-12 per day) and not use it as a primary mobile unit which is transported between diagnostic facilities.

NOTE: If conditions exist which exceed typical usage and patient load, then it is recommended to increase the maintenance frequencies.

Abbreviations used in the Periodic Maintenance Schedule Table 10-2:

- D = Daily
- W = Weekly
- M = Monthly
- A = Annually

10-3-1 How often should care & maintenance tasks be performed? (cont'd)

Table 10-2 Periodic Maintenance Schedule

Item	Service at Indicated Time	D	W	M	A	Notes
Air Filter Grid	Clean the air filter grid with vacuum cleaner from outside (left side of the system front view).			•		more frequently depending on your environment
Air Filter Grid	Remove back panel and board chassis and clean the housing from inside. (vacuum cleaner and soft brush)				•	more frequently depending on your environment
AC Mains Cable	Inspect AC Mains Cable			•		Mobile Unit Check weekly
Cables and Connectors	Remove the Back Panel and check if all cables are well seated and if there is no mechanical damage visible; Check if they are fixed and well seated at the correct position.				•	also after corrective maintenance
User Interface	Clean alphanumerical keyboard, Functional keys, Digital potentiometers, TGC-Shift potentiometers. (vacuum cleaner, lukewarm soap water on a soft, damp cloth)		•			Be careful not to get the cloth too wet so that moisture does not enter the loudspeakers, TGC-Slider, or other keys!
Monitor and Probe holder	Clean Top surface, Monitor and Probe holder with a fluid detergent in warm water on a soft, damp cloth.		•			Be careful not to get the cloth too wet so that moisture does not enter the entire system.
Mechanical parts	Clean and inspect the mechanical function of wheels, casters, brakes and swivel locks as well as side door, foot rest, front and rear handle, and monitor holder. Remove Dust and Coupling gel.			•		Mobile Unit Check Daily
Control Panel movement	Check Turn mechanism				•	Mobile Unit Check Daily
Trackball Check	Check proper operation (Cursor movement X, Y direction)	•				If failure occurs go to trackball cleaning.
Trackball Cleaning	Remove trackball ring; open the trackball housing and take out the trackball (refer to Section 7-7-3 on page 7-14). Clean the trackball (and X, Y axes) with soft tissue and screwdriver shaft.				•	
Disk Drives (Sonoview Data Backup)	Test Image filing (Sonoview) Import and Export data capability (MO-, CD-RW Drive)		•	•*		* save the image filing data monthly or weekly on CD depending on the number of examinations
Safe Probe Operation	Clean probes and probe cables and check acoustic lens housing (cracks) and probe cables. In case of mechanical damage, don't use them! **Danger:** Safety risk for operator and patient.	•*				* or before each use
Probe Air bubbles	To detect air bubbles in filling liquid, shake the probe carefully and check abnormal noise.					
Probe connectors	Remove dust/dirt of all probe connectors. Clean with vacuum cleaner if dust is visible.			•		

Table 10-2 Periodic Maintenance Schedule

Item	Service at Indicated Time	D	W	M	A	Notes
Console Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Peripheral Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Surface Probe Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Endocavity Probe Leakage Current Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Measurement Accuracy Checks					•	Also after corrective maintenance or as required by your facilities QA program.
Probe/Phantom Checks	Check axial and lateral resolution (see Basic User Manual Technical specifications). Check Gain and TGC changes, vary the focus and check reaction on screen. *NOTE! The use of a Phantom is not required during Preventive Maintenance. Customer may use it as part of their Quality Assurance Program tests.*				•	Also after corrective maintenance or as required by your facilities QA program.
Functional Checks of all probes Section 10-5-2 on page 10-7	*NOTE! The use of a Phantom is not required during Preventive Maintenance. Customer may use it as part of their Quality Assurance Program tests.*				•	Also after corrective maintenance or as required by your facilities QA program.

Section 10-4
Tools Required

10-4-1 Special Tools, Supplies and Equipment used for Maintenance

Table 10-3 Overview of Requirements for Care & Maintenance

Tool	Part Number	Comments
Digital Volt Meter (DVM)		minimum 5% accuracy, 3.5 digit and 200 Ohm range required
Anti Static Kit	46–194427P231 46–194427P279 46–194427P369 46–194427P373 46–194427P370	Kit includes anti–static mat, wrist strap and cables for 200 to 240 V system 3M #2204 Large adjustable wrist strap 3M #2214 Small adjustable wrist strap 3M #3051 conductive ground cord
Anti Static Vacuum Cleaner	46–194427P278 46–194427P279	120V 230V
QIQ Phantom	E8370RB	RMI Grayscale Target Model 403GS *NOTE! The use of a Phantom is not required during Preventive Maintenance. Customer may use it as part of their Quality Assurance Program tests.*
CD-RW Media		(minimum quad speed)
DVD+RW Disc Media blank		blank 4,7GB DVD+RW disc
B/W Printer Cleaning Sheet		see printer user manual for requirements
Color Printer Cleaning Sheet		see printer user manual for requirements
Disposable Gloves		

Section 10-5
System Maintenance

10-5-1 Preliminary Checks

The preliminary checks take about 15 minutes to perform. Refer to the system user documentation whenever necessary.

Table 10-4 System Checks

Step	Item	Description
1	Ask & Listen	Ask the customer if they have any problems or questions about the equipment.
2	Paperwork	Fill in the top of the Ultrasound Inspection Certificate. Note all probes and system options.
3	Power up	Turn the system power on and verify that all fans and peripherals turn on. Watch the displays during power up to verify that no warning or error messages are displayed.
4	Probes	Verify that the system properly recognizes all probes.
5	Displays	Verify proper display on the monitor.
6	Presets	“Full Backup” all customer presets on Hard disk and/or DVD (see: Section 4-5-3 "Save Full Backup (Presets, Configurations & Application Settings)" on page 4-36).

10-5-2 Functional Checks

The functional checks take about 60 minutes to perform.
Refer to the Voluson® 730Pro/ProV Basic User Manual whenever necessary.

10-5-2-1 System Checks

Table 10-5 System Functional Checks

Step	Item	Description
1	B Mode	Verify basic B Mode (2D) operation. Check the basic system controls that affect this mode of operation.
2	M Mode	Verify basic M Mode operation. Check the basic system controls that affect this mode of operation.
3	C Mode	Verify basic CFM Mode (Color Flow Mode) operation. Check the basic system controls that affect this mode of operation.
4	PD Mode	Verify basic PD Mode (Power Doppler Mode) operation. Check the basic system controls that affect this mode of operation.
5	Doppler Modes	Verify basic Doppler Mode operation (PW and CW if available). Check the basic system controls that affect this mode of operation.
6	3D Mode	Verify basic 3D Mode operation. Check the basic system controls that affect this mode of operation.
7	*Applicable Software Options	Verify the basic operation of all optional modes Check the basic system controls that affect each options operation.
8	Keyboard Test	Perform the Keyboard Test Procedure to verify that all keyboard controls are OK.
9	Monitor	Verify basic Monitor display functions.
10	Measurements	Scan a gray scale phantom and use the measurement controls to verify distance and area calculation accuracy. Refer to the Basic User Manual, Chapter 13, for measurement accuracy specifications.

*NOTE: * Some software may be considered standard depending upon system model configuration.*

10-5-2-2 Peripheral/Option Checks

If any peripherals or options are not part of the system configuration, the check can be omitted. Refer to Table 3-8, “Approved Peripherals,” on page 3-64 for a list of approved peripherals.

Table 10-6 Approved Peripheral/Hardware Option Functional Checks

Step	Item	Description
1	VCR	Verify record/playback capabilities of the VCR. Clean heads and covers if necessary.
2	DVD Recorder	Verify record capabilities of the DVD recorder. Clean heads and covers if necessary.
3	B/W Printer	Verify hardcopy output of the B/W video page printer. Clean heads and covers if necessary.
4	Color Printer	Verify hardcopy output of the Color video page printer. Clean heads and covers if necessary.
5	Line Printer / Bluetooth Printer	Verify hardcopy output of the Line or Bluetooth printer. Clean heads and covers if necessary.
6	DICOM	Verify that DICOM is functioning properly. Send an image to a DICOM device.
7	Footswitch	Verify that the footswitch is functioning as programed. Clean as necessary.
8	DVD and/or MO-Drive	Verify that the DVD-drive and/or optional MO-drive reads/writes properly (export/recall images in Sonoview).
9	Modem	Verify modem remote connection.
10	ECG	Verify basic operation with customer.

10-5-2-3 Mains Cable Inspection

Table 10-7 Mains Cable Inspection

Step	Item	Description
1	Unplug Cord	Disconnect the mains cable from the wall and system.
2	Inspect	Inspect it and its connectors for damage of any kind.
3	Verify	Verify that the LINE, NEUTRAL and GROUND wires are properly attached to the terminals, and that no strands may cause a short circuit.
4	Verify	Inlet connector retainer is functional.

10-5-2-4 Optional Diagnostic Checks

Optionally you can access the diagnostic software as described in Chapters 5 or 7. View the error logs and run desired diagnostics.

10-5-3 Physical Inspection

Table 10-8 Physical Checks

Step	Item	Description
1	Labeling	Verify that all system labeling is present and in readable condition.
2	Scratches & Dents	Inspect the console for dents, scratches or cracks.
3	Control Panel and Keyboard	Inspect keyboard and control panel. Note any damaged or missing items. (Replace faulty components as required.) Verify proper operation of Control Panel backlighting and TGC sliders.
4	Control Panel Movement	Verify ease of control panel (Operator I/O Panel) movement in acceptable direction. Ensure that it latches in position as required.
5	Wheels & Brakes	Check all wheels and casters for wear and verify operation of foot brake, to stop the unit from moving, and release mechanism. Check all wheel locks and swivel locks for proper operation.
6	Cables & Connectors	Check all internal cable harnesses and connectors for wear and secure connector seating. Pay special attention to footswitch assembly and probe strain or bend reliefs.
7	Shielding & Covers	Check to ensure that all EMI shielding, internal covers, air flow panels and screws are in place. Missing covers and hardware could cause EMI/RFI problems while scanning.
8	External I/O	Check all connectors for damage and verify that the labeling is good.
9	Op Panel Lights	Check proper operation of all operator panel key illuminations (flash once during system start-up).
10	External Microphone	Check for proper operation of external microphones by recording an audio test if available.

NOTICE There is no Microphone built in and released for Voluson® 730Pro/ProV.

10-5-4 Cleaning

10-5-4-1 General Cleaning

Frequent and diligent cleaning of the Voluson® 730Pro ultrasound system reduces the risk of spreading infection from person to person, and also helps to maintain a clean work environment.

Table 10-9 General Cleaning

Step	Item	Description
1	Console	Use a fluid detergent in warm water on a soft, damp cloth to carefully wipe the entire system. Be careful not to get the cloth too wet so that moisture does not enter the console. **Caution:** DO NOT allow any liquid to drip or seep into the system.
2	Monitor	Clean Top surface and Monitor and with a fluid detergent in warm water on a soft, damp cloth. **Caution:** DO NOT spray any liquid directly onto the systems Covers, Monitor, keyboard, etc.

10-5-5 Probe Maintenance

10-5-5-1 Probe Related Checks

Table 10-10 Probe Related Checks

Step	Item	Description
1	Probes	Thoroughly check the system probe connectors and remove dust from inside the connector sockets if necessary. Visually check for bent, damaged or missing pins.
2	Probe Holder	Clean probe holders (they may need to be soaked to remove excess gel).

10-5-5-2 Basic Probe Care

The Basic User Manual and/or care card provides a complete description of probe care, maintenance, cleaning and disinfection. Ensure that you are completely familiar with the proper care of GE probes.

Ultrasound probes can be easily damaged by improper handling. Review the Basic User Manual of Voluson® 730Pro/ProV for more details. Failure to follow these precautions can result in serious injury and equipment damage. Failure to properly handle or maintain a probe may also void its warranty.

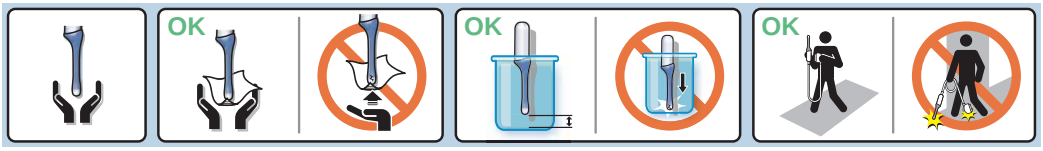


Figure 10-1 Care Card

Any evidence of wear indicates the probe cannot be used.

Do a visual check of the probe pins and system sockets before plugging in a probe.

10-5-5-3 Basic Probe Cleaning and/or Disinfection

Refer to the Basic User Manual of Voluson® 730Pro/ProV for details on cleaning and disinfection.

WARNING ***To help protect yourself from blood borne diseases, wear approved disposable gloves. These are made of nitrile derived from vegetable starch to prevent allergic latex reactions.***

CAUTION **Failure to follow the prescribed cleaning or disinfection procedures will void the probe's warranty.**

DO NOT soak or wipe the lens with any product not listed in the Voluson® 730Pro/ProV Basic User Manual and/or care card. Doing so could result in irreparable damage to the probe and/or Voluson® 730Pro/ProV system.

CAUTION **Follow the Care Card instructions supplied with each probe (inside the transducer boxes) for disinfectants and gels that are compatible with the surface material of the probes.**

NOTICE For the latest list of compatible cleaning solutions and disinfectants refer to:
http://www.gehealthcare.com/usen/ultrasound/products/probe_care.html

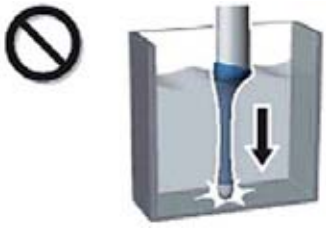
CAUTION **Disinfect a defective probe before you return it. Be sure to tag the probe as being disinfected.**

10-5-5-3 Basic Probe Cleaning and/or Disinfection (cont'd)

CAUTION

Please be aware of the sensitive probe head.

TAKE EXTREME CARE!



NEVER place or store a probe on its scan head!

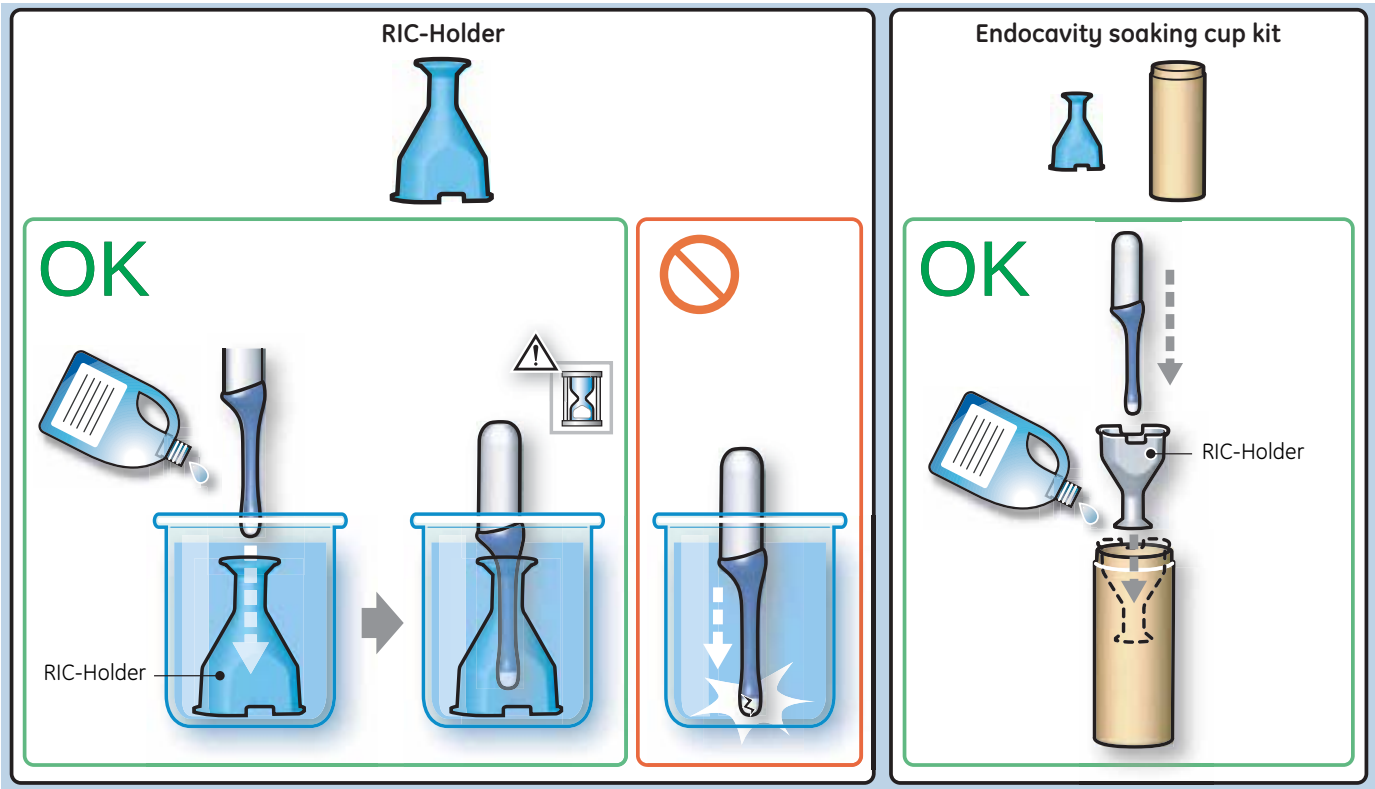
When disinfecting a probe, ensure that there is sufficient space between the probe and the container bottom!

10-5-5-4 Disinfection by means of the RIC-Holder

Especially for Real-time 4D endocavity probes (RIC), it is necessary to take extreme care when transporting the system with the probe attached, or during the disinfection process. Inadequate handling may lead to dead elements, shocked head mechanics, etc.

The RIC-Holder (especially developed for RIC Real-time 4D endocavity probes) guarantees that the sensitive probe head does not hit the bottom of the container during the disinfection procedure.

NOTE: Instructions are supplied with each RIC-Holder (KTZ225469).



Section 10-6
Using a Phantom

The use of a Phantom is not required during Preventive Maintenance.
Customer may use it as part of their Quality Assurance Program tests.

Section 10-7
Electrical Safety Tests

10-7-1 Safety Test Overview

The electrical safety tests in this section are based on IEC60601 standartd including national deviatons for Health Care Facilities and IEC 62353 Medical electrical equipment – Recurrent test and test after repair of medical electrical equipment. These standards provide guidance on evaluating electrical safety of medical devices which are placed into service and are intended for use in planned maintenance (PM) or testing following service or repair activities. They differ somewhat from the standards that are used for design verification and manufacturing tests (e.g., IEC 60601-1 including national deviations) which require a controlled test environment and can place unnecessary stress on the system.

Prior to initiating any electrical test, the system must be visually inspected. Perform the following visual checks:

- Check for missing or loose enclosure covers that could allow access to internal live parts.
- Examine the mains cord, mains plug and appliance inlet for damaged insulation and adequacy of strain relief and cable clamps.

Locate and examine all associated transducers. Inspect the cables and strain relief at each end. Inspect the transducer enclosure and lens for cracks, holes and similar defects.

CAUTION **Compare all safety-test results with safety-test results of previously performed safety tests (e.g. last year etc). In case of unexplainable abrupt changes of safety-test results consult experienced authorized service personnel or GE for further analysis.**

WARNING ***Equipment users must ensure that safety inspections are performed whenever damage is suspected and at least every 12 months in accordance with local authorities and facility procedures.***
DO NOT use the system or individual probes which fail any portion of the safety test.

WARNING ***TO MINIMIZE RISK OF ELECTRIC SHOCK, ONLY TRAINED PERSONS ARE ALLOWED TO PERFORM THE ELECTRICAL SAFETY INSPECTIONS AND TESTS.***

CAUTION **To avoid electrical shock, the unit under test must not be connected to other electrical equipment. Remove all interconnecting cables and wires. The unit under test must not be contacted by users or patients while performing these tests.**

CAUTION **Possible risk of infection. Do not handle soiled or contaminated probes and other components that have been in patient contact. Follow appropriate cleaning and disinfecting procedures before handling the equipment.**

CAUTION **For all instructions in Section 10-7:**
In case of using an UPS (uninterruptable power supply) the terms outlet, wall outlet, AC wall outlet or power outlet refer to the AC power outlet of the UPS.
In case of further available AC (or DC) power outlets at the same used UPS these must remain unused; i.e. not connected to any other devices.

10-7-2 Leakage Current Limits

NOTE: The following acceptance limits and test conditions are summarized from IEC60601 including national deviations and IEC 62353 and in some cases are lower than that specified by the standards. In accordance with these standards, fault conditions like Reverse Polarity of the supply mains and Open Neutral are no longer required for field evaluation of leakage current. Because the main source of leakage current is the mains supply, there are different acceptance limits depending on the configuration of the mains (100-120VAC or 230-240VAC).

Table 10-11 Leakage Current Limits for Operation on 100-120 Volt Mains (US/Canada/Japan)

Leakage Current Test	System Power	Grounding/PE Conductor	Limit mA
Chassis/Enclosure Leakage	On and Off	Open	0.3
Type BF Applied Parts	On (transmit)	Closed Open	0.1 0.5
Type CF Applied Parts	On (transmit)	Closed Open	0.01 0.05
Type CF Applied Parts (sink leakage)	On and Off	Closed	0.05

Table 10-12 Leakage Current Limits for System Operation on 230-240 Volt Mains

Leakage Current Test	System Power	Grounding/PE Conductor	Limit mA
Chassis/Enclosure Leakage	On	Open and Closed	0.5
Type BF Applied Parts	On (transmit)	Open	0.5
Type CF Applied Parts	On (transmit)	Open	0.05
Type CF Applied Parts (sink leakage)	On and Off	Closed	0.05

Table 10-13 ISO (on Dale 600) and Mains Applied (on Dale 601) Limits*

Probe Type	Measurement
BF	5 mA
CF	0.05 mA

* **ISO** (on Dale 600) and **Mains Applied** (on Dale 601) refer to the sink leakage test where mains (supply) voltage is applied to the part to determine the amount of current that will pass (or sink) to ground if a patient contacted mains voltage.

Table 10-14 Equipment Type and Test Definitions

Applied Parts (AP)	Parts or accessories that contact the patient to perform their function. For ultrasound equipment, this includes transducers and ECG leads.	
Type BF	Body Floating or non-conductive ultrasound probes which are marked with the 'man in box' BF symbol. This includes all transducers.	
Type CF	Cardiac Floating or non-conductive intraoperative probes for direct cardiac contact and isolated ECG connections so marked with the 'heart in box' CF symbol.	
Sink Leakage	The current resulting from the application of mains voltage to the applied part. This test is required test for Type CF applied parts.	

10-7-3 Outlet Test - Wiring Arrangement - USA & Canada

Test all outlets in the area for proper grounding and wiring arrangement by plugging in the neon outlet tester and noting the combination of lights that are illuminated. Any problems found should be reported to the hospital immediately and the receptacle should not be used.

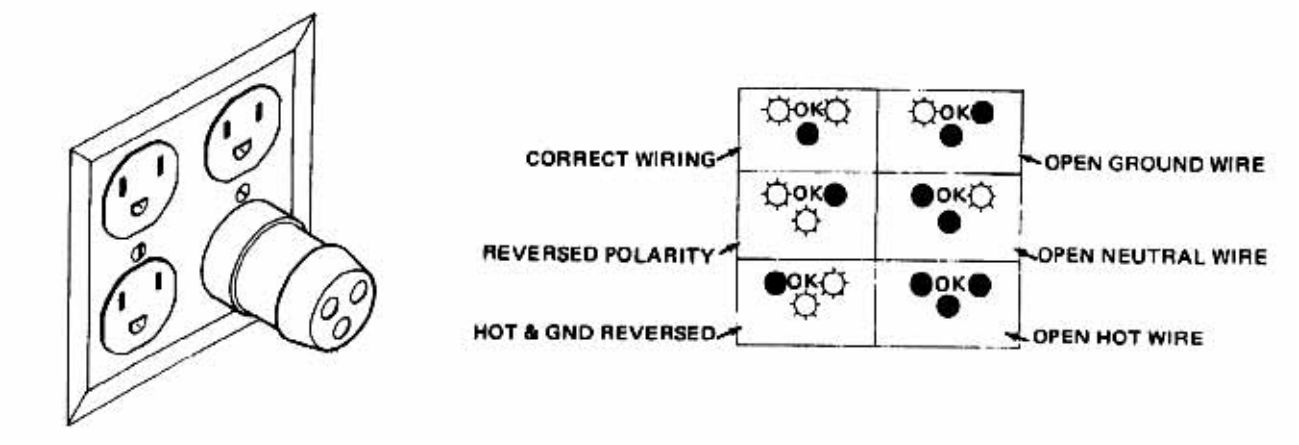


Figure 10-2 Typical Outlet Tester

NOTE: No outlet tester can detect the condition where the Neutral (grounded supply) conductor and the Grounding (protective earth) conductor are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.

10-7-4 Grounding Continuity

CAUTION **Electric Shock Hazard.**
The patient or operator MUST NOT come into contact with the equipment during this test

Measure the resistance from the third pin of the attachment plug to the exposed metal parts of the case. The ground wire resistance should be less than **0.2** ohm.
Reference the procedure in the IEC 60601-1-1.

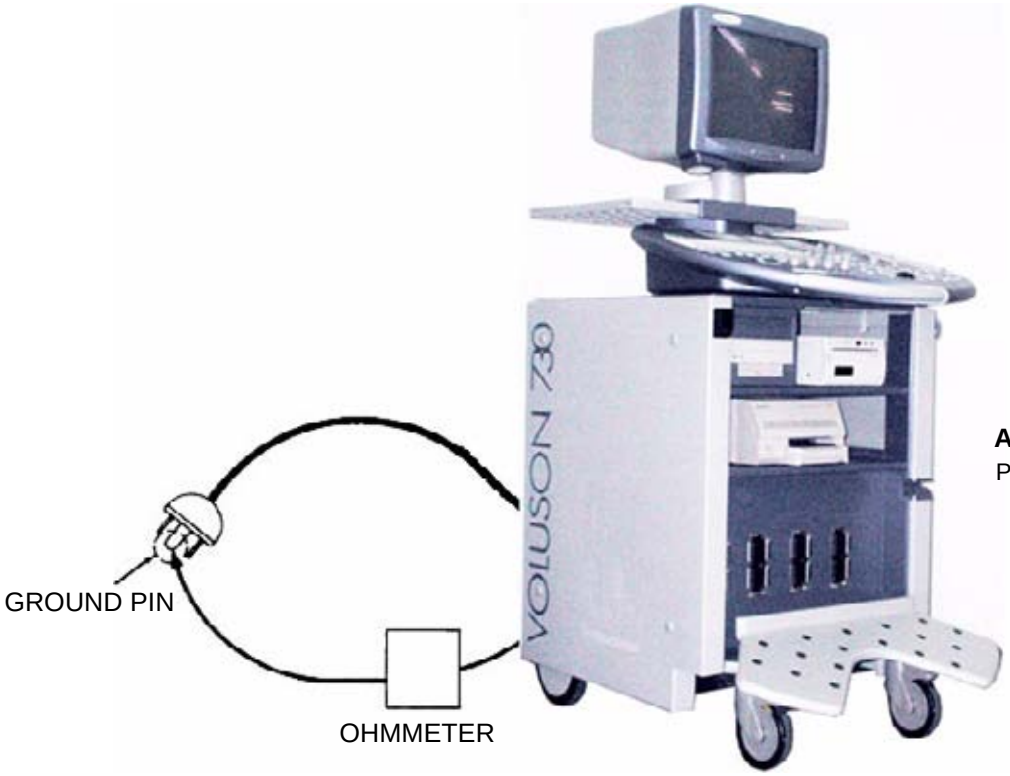


Figure 10-3 Ground Continuity Test

CAUTION **Lacquer is an isolation barrier! Resistor may be high-impedance!**
Measure only on blank parts, stated in Figure 10-3, above.

10-7-4-1 Meter Procedure

Follow these steps to test the Ground wire resistance.

1.) Turn the Voluson® 730Pro/ProV unit OFF.
2.) Plug the unit into the meter, and the meter into the tested AC wall outlet.
3.) Plug the black chassis cable into the meter's “CHASSIS” connector and attach the black chassis cable clamp to an exposed metal part of the Voluson® 730Pro/ProV unit.
4.) Set the meter’s “FUNCTION” switch to the RESISTANCE position.
5.) Set the meter's “POLARITY” switch to the OFF (center) position.
6.) Measure and record the Ground wire resistance.

10-7-5 Chassis Leakage Current Test

DANGER **Electric Shock Hazard.**

When the meter's ground switch is OPEN, DO NOT touch the unit!

CAUTION **Equipment damage possibility. Never switch the Polarity and the status of Neutral when the unit is powered ON. Be sure to turn the unit power OFF before switching them using the POLARITY switch and/or the NEUTRAL switch. Otherwise, the unit may be damaged.**

10-7-5-1 Definition

This test measures the current that would flow through a grounded person who touches the accessible conductive parts of the equipment during normal and fault conditions.
The test verifies the isolation of the power line from the chassis.

The meter is connected to parts of the equipment, easily contacted by the user or patient.
Measurements should be made under the test conditions specified in:

- Table 10-11 on page 10-13, or
- Table 10-12 on page 10-13, as applicable.

Record the highest reading.

10-7-5-2 Generic Procedure

The test verifies the isolation of the power line from the chassis.
The testing meter is connected from accessible metal parts of the case to ground.
Measurements should be made under the test conditions specified in:

- Table 10-11 on page 10-13, or
- Table 10-12 on page 10-13, as applicable.

Record the highest reading of current.

When using the Microguard or a similar test instrument, its power plug may be inserted into the wall outlet and the equipment under test is plugged into the receptacle on the panel of the meter.
This places the meter in the grounding conductor and the current flowing from the case to ground will be indicated in any of the current ranges.

The maximum allowable limit for chassis source leakage is shown in:

- Table 10-11 on page 10-13, or
- Table 10-12 on page 10-13, as Chassis/Enclosure Leakage.

10-7-5-3 Data Sheet for Enclosure/Chassis Leakage Current

Table 10-15 shows a typical format for recording the enclosure/chassis leakage current. Measurements should be recorded from multiple locations for each set of test conditions.

The actual location of the test probe may vary by system.
Record all data in the Electrical safety tests log.

Table 10-15 Typical Data Format for Recording Chassis Source Leakage

Unit Under Test: _____ **Date of Test:** _____

Test Conditions		Measurement/Test Point Location			
System Power	**Grounding/PE**	***Potential equilibrium connector***	***Monitor housing***	***Probe connector***	
off	closed				
off	open				
on	closed				
on	open				

10-7-6 Isolated Patient Lead (Source) Leakage-Lead to Ground

CAUTION **Equipment damage possibility. Never switch the Polarity when the unit is powered ON. Be sure to turn the unit power OFF before switching the polarity using the POLARITY switch. Otherwise, the unit may be damaged.**

10-7-6-1 Definition

This test measures the current which would flow to ground from any of the isolated ECG leads. The meter simulates a patient who is connected to the monitoring equipment and is grounded by touching some other grounded surface.

Measurements should be made under the test conditions specified in:

- Table 10-11 on page 10-13, or:
- Table 10-12 on page 10-13, as applicable.

For each combination the operating controls, such as the lead switch, should be operated to find the worst case condition.

10-7-6-2 Generic Procedure

Measurements should be made under the test conditions specified in:

- Table 10-11 on page 10-13, or:
- Table 10-12 on page 10-13, as applicable.

For each combination the operating controls, such as the lead switch, should be operated to find the worst case condition.

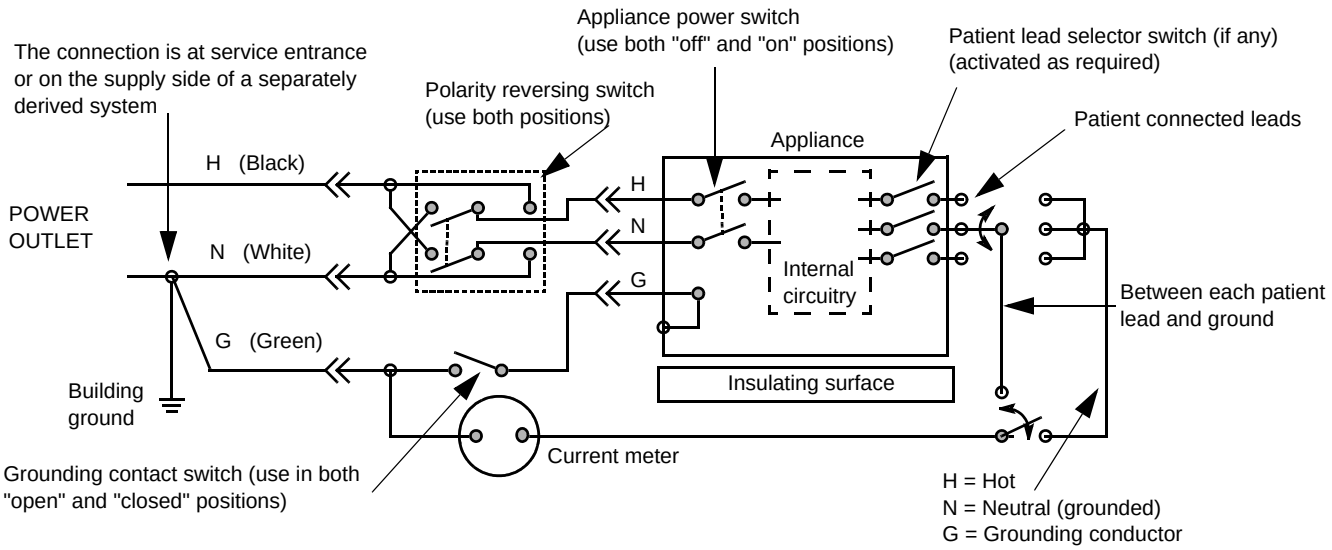

The connection is at service entrance or on the supply side of a separately derived system
Appliance power switch (use both "off" and "on" positions)
Patient lead selector switch (if any) (activated as required)
Polarity reversing switch (use both positions)
Appliance
Patient connected leads
H (Black)
POWER OUTLET
N (White)
G (Green)
H
N
G
Internal circuitry
Between each patient lead and ground
Building ground
Insulating surface
Current meter
Grounding contact switch (use in both "open" and "closed" positions)
H = Hot
N = Neutral (grounded)
G = Grounding conductor

Figure 10-4 Test Circuit for Measuring Patient Lead Leakage

10-7-7 Isolated Patient Lead (Source) Leakage–Lead to Lead

When using the Dale 600, switch the meter's function selector to the LEAD-LEAD position.

Select and test each of the ECG lead positions (except ALL) on the LEAD selector, testing each to the power and ground condition combinations found in:

- Table 10-11 on page 10-13, or:
- Table 10-12 on page 10-13, as applicable.

Record the highest leakage current measured.

10-7-7-1 Lead to Lead Leakage Test Record

Table 10-16 shows a typical format for recording the patient lead to lead leakage current.

Measurements should be recorded from each lead combination under each set of test conditions specified in:

- Table 10-11 on page 10-13, or:
- Table 10-12 on page 10-13, as applicable.

Record all data on the EQC inspection certificate.

Table 10-16 Typical Data Format for Recording Patient Lead to Lead Leakage

Unit Under Test: _____ **Date of Test:** _____

Test Conditions		Patient Lead or Combination Measured		
System Power	**Grounding/PE**	***RA-LA***	***LA-LL***	***LL-RA***
Mains on	*open*			
RF on	*open*			

NOTE: Values in italics font are given as examples only.

10-7-8 Isolated Patient Lead (Sink) Leakage-Isolation Test

CAUTION **Line voltage is applied to the ECG leads during this test. To avoid possible electric shock hazard, the system being tested must not be touched by patients, users or anyone while the ISO TEST switch is depressed.**

1.) When using the Dale 600, switch the meter's function selector to the LEAD-ISO.
2.) Select the ALL position on the lead selector since the test is performed with mains applied to all leads at the same time.
3.) Depress the rocker switch to ISO TEST to test lead isolation.

10-7-8-1 Isolated Lead (sink) Leakage Test Record

Table 10-17 shows a typical format for recording the isolated patient lead sink leakage current.

Measurements should be recorded for the full lead combination under each set of test conditions specified in:

- Table 10-11 on page 10-13, or:
- Table 10-12 on page 10-13, as applicable.

Record all data on the EQC inspection certificate.

Table 10-17 Typical Data Format for Recording Patient Lead to Lead Leakage

Unit Under Test: _____ **Date of Test:** _____

Test Conditions		Patient Lead or Combination Measured		
System Power	**Grounding/PE**	***RA-LA***	***LA-LL***	***LL-RA***
Mains on	*open*			
RF on	*open*			

NOTE: Values in italics font are given as examples only.

10-7-9 Probe Leakage Current Test

DANGER **Do not use the probe if the insulating material has been punctured or otherwise compromised. Integrity of the insulation material and patient safety can be verified by safety testing according to IEC60601-1.**

10-7-9-1 Definition

This test measures the current that would flow to ground from any of the probes through a patient who is being scanned and becomes grounded by touching some other grounded surface.

NOTE: Some leakage current is expected on each probe, depending on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement. It is abnormal if no leakage current is measured.
If no leakage current is detected, check the configuration of the test equipment.

10-7-9-2 Tools

For needed tools, see: Section 10-4 "Tools Required" on page 10-5

10-7-9-3 Generic Procedure on Probe Leakage Current

The most common method of measuring probe leakage is to partly immerse the probe into a saline bath while the probe is connected to the ultrasound system and active.
This method measures the actual leakage current resulting from the transducer RF drive.

Measurements should be made under the test conditions specified in:

- Table 10-11 on page 10-13, or:
- Table 10-12 on page 10-13, as applicable.

For each combination, the probe must be active to find the worst case condition.

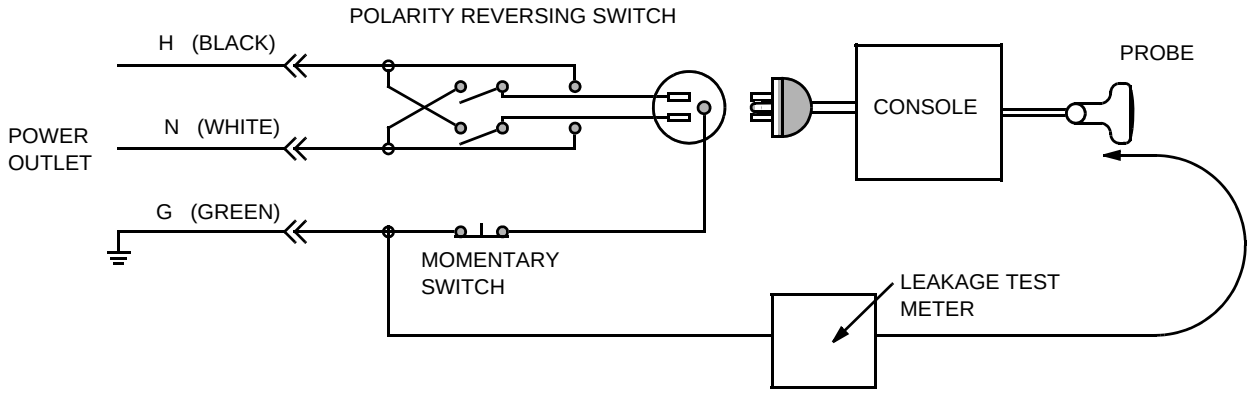


Figure 10-5 Set Up for Probe Leakage Current

NOTE: Each probe will have some amount of leakage current, dependent on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement.

Section 10-8
When There's Too Much Leakage Current...

10-8-1 Chassis Fails

Check the ground on the power cord and plug for continuity. Ensure the ground is not broken, frayed, or intermittent. Replace any defective part.

Tighten all grounds. Ensure star washers are under all ground studs.
Inspect wiring for bad crimps, poor connections, or damage.

Test the wall outlet; verify it is grounded and free of other wiring abnormalities. Notify the user or owner to correct any deviations. As a work around, check the other outlets to see if they could be used instead.

NOTE: No outlet tester can detect the condition where the white neutral wire and the green grounding wire are reversed. If later tests indicate high leakage currents, this should be suspected as a possible cause and the outlet wiring should be visually inspected.

10-8-2 Probe Fails

- Test another probe to isolate if the fault lies with the probe or the scanner.

NOTE: Each probe will have some amount of leakage, dependent on its design. Small variations in probe leakage currents are normal from probe to probe. Other variations will result from differences in line voltage and test lead placement. The maximum allowable leakage current for body surface contact probe differs from inter-cavity probe. Be sure to enter the correct probe type in the appropriate space on the check list.

- Test the probe in another connector to isolate if the fault lies with the probe or the scanner.

  If excessive leakage current is slot dependent, inspect the system connector for bent pins, poor connections, and ground continuity.

  If the problem remains with the probe, replace the probe.

10-8-3 Peripheral Fails

Tighten all grounds. Ensure star washers are under all ground studs.

Inspect wiring for bad crimps, poor connections, or damage.

10-8-4 Still Fails

If all else fails, begin isolation by removing the probes, external peripherals, then the on board ones, one at a time while monitoring the leakage current measurement.

10-8-5 New Unit

If the leakage current measurement tests fail on a new unit and if situation can not be corrected, submit a Safety Failure Report to document the system problem. Remove unit from operation.

10-8-6 ECG Fails

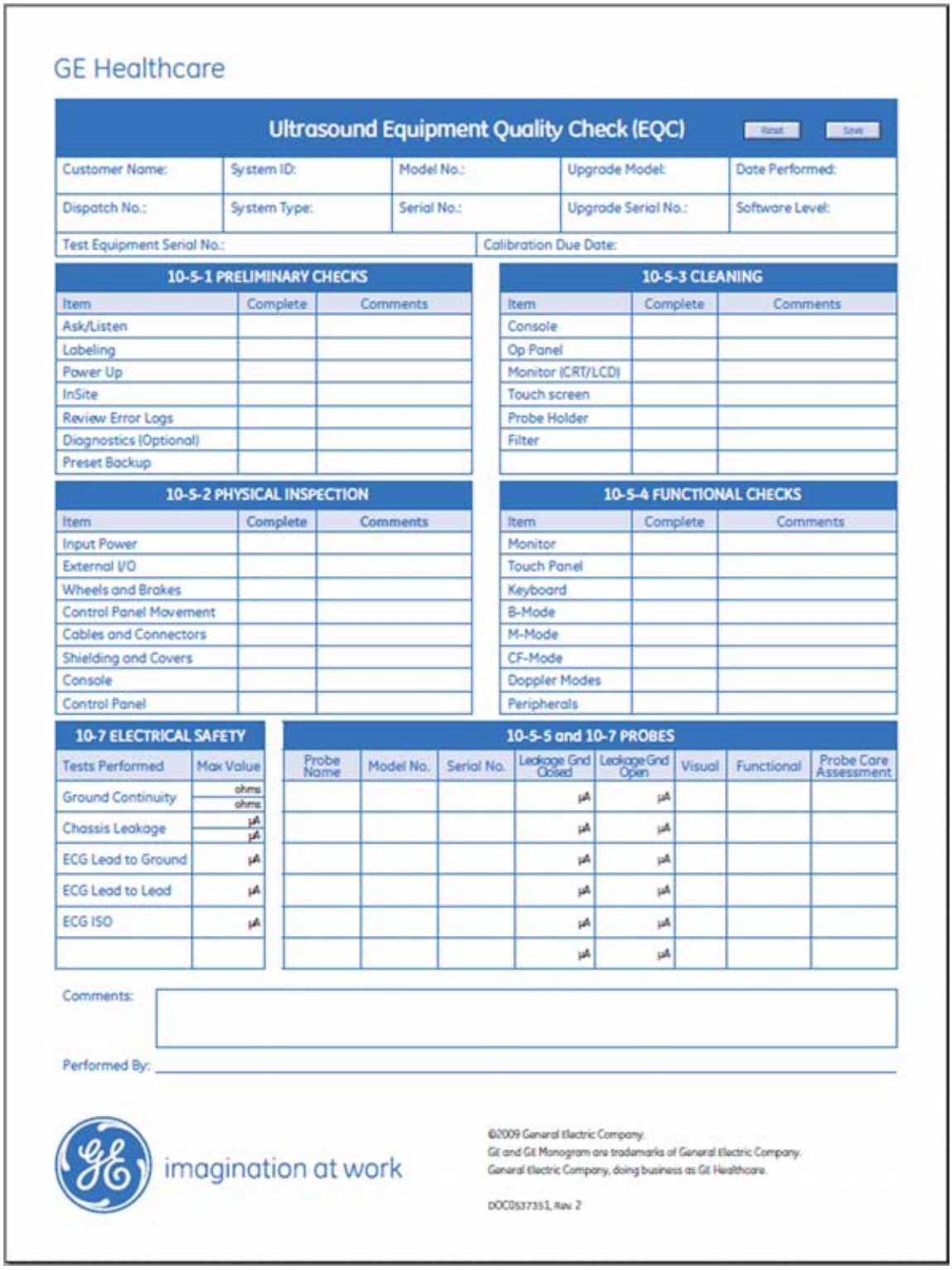
Inspect cables for damage or poor connections.

10-8-7 In case of using an UPS (Uninterruptable Power Supply)

In case of using an UPS (Uninterruptable Power Supply) repeat the tests without using the UPS, i.e. directly plug the ultrasound system to the AC wall outlet.

Section 10-9
Ultrasound Equipment Quality Check (EQC)

Please download and use the latest version of this form (DOC0537351). It is stored in MyWorkshop.



GE Healthcare

Ultrasound Equipment Quality Check (EQC)

Customer Name:	System ID:	Model No.:	Upgrade Model:	Date Performed:
Dispatch No.:	System Type:	Serial No.:	Upgrade Serial No.:	Software Level:
Test Equipment Serial No.:		Calibration Due Date:		

10-5-1 PRELIMINARY CHECKS

Item	Complete	Comments
Ask/Listen		
Labeling		
Power Up		
InSite		
Review Error Logs		
Diagnostics (Optional)		
Preset Backup		

10-5-3 CLEANING

Item	Complete	Comments
Console		
Op Panel		
Monitor (CRT/LCD)		
Touch screen		
Probe Holder		
Filter		

10-5-2 PHYSICAL INSPECTION

Item	Complete	Comments
Input Power		
External I/O		
Wheels and Brakes		
Control Panel Movement		
Cables and Connectors		
Shielding and Covers		
Console		
Control Panel		

10-5-4 FUNCTIONAL CHECKS

Item	Complete	Comments
Monitor		
Touch Panel		
Keyboard		
B-Mode		
M-Mode		
CF-Mode		
Doppler Modes		
Peripherals		

10-7 ELECTRICAL SAFETY

Tests Performed	Max Value
Ground Continuity	ohms / ohms
Chassis Leakage	µA / µA
ECG Lead to Ground	µA
ECG Lead to Lead	µA
ECG ISO	µA

10-5-5 and 10-7 PROBES

Probe Name	Model No.	Serial No.	Leakage Gnd Closed	Leakage Gnd Open	Visual	Functional	Probe Care Assessment
			µA	µA			
			µA	µA			
			µA	µA			
			µA	µA			
			µA	µA			
			µA	µA			

Comments:

Performed By: _____

imagination at work

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DOC0537351, Rev 2

Figure 10-6 Ultrasound Equipment Quality Check (EQC)

Section 10-10
Electrical Safety Test Form

Electrical Test Performed	Max Value Allowed	Value Measured	OK?	Comments
Outlet (correct ground & wiring config.)				
System Ground Continuity				
Chassis Source Leakage Current - Potential equilibrium connector				
Chassis Source Leakage Current - Monitor housing				
Chassis Source Leakage Current - Probe connector				
Patient Lead Source Leakage (Lead to Ground)				
Patient Lead Source Leakage (Lead to Lead)				
Patient Lead Source Leakage (Isolation)				
Peripheral 1 Leakage Current				
Peripheral 1 Ground Continuity				
Peripheral 2 Leakage Current				
Peripheral 2 Ground Continuity				
Peripheral 3 Leakage Current				
Peripheral 3 Ground Continuity				

PROBES

Probe Number (from previous page)	Max Value Allowed	Max Value Measured	OK?	Comments
Probe 1:				
Probe 2:				
Probe 3:				
Probe 4:				
Probe 5:				
Probe 6:				
Probe 7:				
Probe 8:				
Probe 9:				

Appendix A
Acoustic Output & Index Determination Tables

Section A-1
Overview

This chapter provides **Acoustic Output Reporting Tables for IEC60601-2-37** (according to Table 101) and a **Summary of measured Quantities for Index Determination** (according to IEC60601-2-37 DD.7, Table DD.2) for all applicable Transducers at different Operating Modes.

Table A-1 Tables for Transducers at different Operating Modes

Transducer	Section / Transducer at Operating Mode	Page Number
AB2-7	A-1-1 Table for AB 2-7 at 2 D Mode (B-Mode)	A-6
	A-1-2 Table for AB 2-7 at Color Flow Mode (CFM-Mode)	A-7
	A-1-3 Table for AB 2-7 at Motion Mode (M-Mode)	A-8
	A-1-4 Table for AB 2-7 at Color Motion Mode (Mc-Mode)	A-8
	A-1-5 Table for AB 2-7 at Pulsed Wave Doppler (PW-Mode)	A-10
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	A-1-7 Table for AC2-5 at Color Flow Mode (CFM-Mode))	A-12
	A-1-8 Table for AC2-5 at Motion Mode (M-Mode)	A-13
	A-1-9 Table for AC2-5 at Color Motion Mode (Mc-Mode)	A-14
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Table A-1 Tables for Transducers at different Operating Modes

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SP6-12	A-1-31 Tables for SP6-12 at 2 D Mode (B-Mode)	A-36
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	A-1-36 Tables for SP10-16 at Color Flow Mode (CFM-Mode)	A-41
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	A-1-40 Table for PA2-5P at Color Flow Mode (CFM-Mode)	A-45
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RAB4-8L	A-1-57 Table for RAB4-8L at 2 D Mode (B-Mode)	A-62
	A-1-58 Table for RAB4-8L at Color Flow Mode (CFM-Mode)	A-63
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RIC5-9H	A-1-77 Table for RIC5-9H at 2 D Mode (B-Mode)	A-82
	A-1-78 Table for RIC5-9H at Color Flow Mode (CFM-Mode)	A-83
	A-1-79 Table for RIC5-9H at Motion Mode (M-Mode)	A-84
	A-1-80 Table for RIC5-9H at Color Motion Mode (Mc-Mode)	A-85
	A-1-81 Table for RIC5-9H at Pulsed Wave Doppler (PW-Mode)	A-86
RIC5-9W	A-1-82 Tables for RIC5-9W at 2 D Mode (B-Mode)	A-87
	A-1-83 Tables for RIC5-9W at Color Flow Mode (CFM-Mode)	A-88
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A-1-1 Table for AB 2-7 at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: AB2-7 **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan $A_{aprt} \leq 1$	$A_{aprt} > 1$	non-scan	
Global Maximum Index Value				1.3	(a)	-	-	-	(a)
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_{ra}	$p_{r.3}$	(MPa)	2.1					
	P	W_o	(mW)		#	-		-	#
	min of $[P_a(z_i), I_{ta.3}(z_i)]$	$[W_{.1}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	1.8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2.5	#	-	-	-	#
	Dim of A_{aprt}	X	(cm)		#	-	-	-	#
		Y	(cm)		#	-	-	-	#
Other Information	t_d	PD	(usec)	0.6					
	prr	PRF	(Hz)	3470					
	p_r at max. I_{pa}	p_r@PII$_{max}$	(MPa)	2.5					
	d_{eq} at max. I_{pa}	d_{eq}@PII$_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}$@MI$_{max}$	(W/cm²)	202					
Operating Control Conditions	B-Imagesector start		(cm)	0.0					
	B-Imagesector end		(cm)	24.0					
	B-Imagesector angle		(Degree)	20.0					
	Quality			low					
	Zoom			1.0					
	Foc. Zones			1					
	Frequency Setting			Mid					
	SENS PRI			-					
	Power		(%)	100					
	ZoomBox start		(cm)	8.8					
	ZoomBox end		(cm)	13.6					
	ZoomBox angle		(Degree)	20.0					
	Mode Type			B(Harm)					
	Focal Depth		(cm)	3.0					

A-1-2 Table for AB 2-7 at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: AB2-7 **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	1,3	-	-	-	2,0
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r.3}$	$p_{a.3}$	(MPa)	#					
	P	W_o	(mW)		86	-	-	-	256
	min of $[P_a(z_s), I_{ta.3}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{sp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pa.3}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	#	3,3	-	-	-	2,8
	Dim of A_{aprt}		X (cm)		1,0	-	-	-	6,2
			Y (cm)		1,3	-	-	-	1,3
Other Information	t_p	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p. at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		5	-	-		5
			FL_y (cm)		8	-	-		8
	$I_{pa.3}$ at max. MI	$I_{pa.3}@MI_{max}$	(W/cm^2)	#					
Operating Control Conditions	B-Imagesector start		(cm)		0,0				0,0
	B-Imagesector end		(cm)		24,0				24,0
	B-Imagesector angle		(Degree)		20,0				80,0
	B-Quality				low				low
	Zoom				1,0				1,0
	Foc. Zones				1				1
	Frequency Setting				penet				penet
	SENS PRI				-				-
	B Tx Power		(%)		1				1
	CFM Box start		(cm)		2,55				2,55
	CFM Box end		(cm)		6,15				6,15
	CFM Box angle		(Degree)		7,33				80,0
	CFM Tx power		(%)		100				100
	Ensemble				9				9
	Line Density				2				9
	Flow Res				high				low
	Velocity Range		(kHz)		7,5				7,5
	CFM Quality				high				high
	CFM Frequency				high				mid

A-1-3 Table for AB 2-7 at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: AB2-7

Operating Mode: M-Mode
(Simultaneous B-Mode incl.)

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	-	<1	<1	1,0
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	-		#	77
	min of $[P_a(z_i), I_{ta.3}(z_i)]$	$[W_{.3}(z_i), I_{TA.3}(z_i)]$	(mW)				#		
	z_s	z_1	(cm)				#		
	z_{bp}	z_{pp}	(cm)				#		
	z_b	z_{sp}	(cm)					#	
	z at max. I_{ta}	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	-	#	#	2,8
	Dim of A_{aprt}	X	(cm)		-	-	#	#	2,5
		Y	(cm)		-	-	#	#	1,3
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	-	#		15
			FL_y (cm)		-	-	#		8
	$I_{ta.3}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						0,0
	B-Imagesector end		(cm)						24,0
	B-Imagesector angle		(Degree)						80,0
	Quality								low
	Zoom								1,0
	Foc. Zones								1
	Frequency Setting								High
	SENS PRI								-
	Power		(%)						100
	Mode Type								M(Harm)
	Focal Depth		(cm)						15,0

A-1-4 Table for AB 2-7 at Color Motion Mode (Mc-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: AB2-7 **Operating Mode:** Mc-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	1,0	-	1,4	2,0
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{a}	$p_{r,3}$	(MPa)	#					
	P	W_o	(mW)		-	63	-	137	137
	min of $[P_a(z_s), I_{ta,3}(z_s)]$	$[W_o(z_1), I_{ITA,3}(z_1)]$	(mW)						
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					0,3	
	z at max. $I_{pi,a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					2,1	
	f_{awf}	f_c	(MHz)	#	-	3,2	-	3,1	3,1
	Dim of A_{aprt}	X	(cm)		-	0,7	-	1,9	1,9
		Y	(cm)		-	1,3	-	1,3	1,3
Other Information	t_{d}	PD	(μsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					1,3	
	Focal Length		FL_x (cm)		-	7	-		15
			FL_y (cm)		-	8	-		8
	$I_{pa,a}$ at max. MI	$I_{PA,3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions									
	B-Imagesector start		(cm)			0,0		0,0	0,0
	B-Imagesector end		(cm)			24,0		24,0	24,0
	B-Imagesector angle		(Degree)			80		80	80
	B-Quality					low		low	low
	Zoom					1,0		1,0	1,0
	Foc. Zones					1		1	1
	Frequency Setting					penet		penet	penet
	SENS PRI					-		-	-
	B Tx Power		(%)			1		1	1
	Mc Tx Power		(%)			100		100	100
	Ensemble					12		16	16
	Flow Res					high		high	high
	Velocity Range		(kHz)			1,8		1,8	1,8
	Speed					5		5	5
	Mc Frequency					High		High	High

A-1-5 Table for AB 2-7 at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: AB2-7 **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	1,4	-	2,0	2,0
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	88		91	140
	min of $[P_{a}(z_i), I_{ta.a}(z_i)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					4,8	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,5	
	f_{awf}	f_c	(MHz)	#	-	3,3	-	2,3	2,7
	Dim of A_{aprt}		X (cm)		-	0,7	-	1,4	1,9
			Y (cm)		-	1,3	-	1,3	1,3
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,5	
	Focal Length		FL_x (cm)		-	7	-		15
			FL_y (cm)		-	8	-		8
	$I_{pa.a}$ at max. MI	$I_{pA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	Gate width		(cm)			0,2		0,9	0,9
	Gate pos		(cm)			2,48		7,38	9,69
	B-Imagesector angle		(Degree)			4,4		2,2	1,3
	Power		(%)			100		100	100

A-1-6 Table for AC2-5 at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: AC2-5 **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1	A_{aprt}>1		
Global Maximum Index Value				1,3	(a)	-	-	-	(a)
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	p_{ra}	$p_{r.3}$	(MPa)	2,0					
	P	W_o	(mW)		#	-	-	-	#
	min of $[P_a(z_s), I_{ta.3}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)						
	z_s	z_1	(cm)				-		
	z_{bp}	z_{np}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pa.a}$	z_{sp}	(cm)	4,7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2,3	#	-	-	-	#
	Dim of A_{aprt}	X (cm)			#	-	-	-	#
		Y (cm)			#	-	-	-	#
Other Information	t_d	PD	(µsec)	0,5					
	prr	PRF	(Hz)	3150					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	2,8					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	155					
Operating Control Conditions	B-Imagesector start		(cm)	0,0					
	B-Imagesector end		(cm)	30,0					
	B-Imagesector angle		(Degree)	68,0					
	Quality		low						
	Zoom		1,0						
	Foc. Zones		1						
	Frequency Setting		nom						
	SENS PRI		-						
	Power		(%)	100					
	ZoomBox start		(cm)	13,0					
	ZoomBox end		(cm)	19,0					
	ZoomBox angle		(Degree)	68,0					
	Mode Type		B						
	Focal Depth		(cm)	15,0					

A-1-7 Table for AC2-5 at Color Flow Mode (CFM-Mode))

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: AC2-5 **Operating Mode:** Color Flow

Index Label					MI	TIS			TIB	TIC
						scan	non-scan		non-scan	
							$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value					(a)	1,6	-	-	-	2,0
Assoc. Acoustic Parameter	IEC	FDA	Units							
		$p_{r.3}$	(MPa)		#					
		W_{o}	(mW)			115	-		-	170
	min of $[P_A(z_1), I_{spta}(z_1)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)							
	z_s	z_1	(cm)							
	z_{bp}	z_{bp}	(cm)							
	z_p	z_{sp}	(cm)		#				-	
	z at max. I_{pa}	z_{sp}	(cm)		#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)						-	
	f_{awf}	f_c	(MHz)		#	3,7	-	-	-	3,7
	Dim of A_{aprt}			X	(cm)	1,3	-	-	-	2,7
				Y	(cm)	1,3	-	-	-	1,3
Other Information	t_d	PD	(µsec)		#					
	prr	PRF	(Hz)		#					
	p_r at max. I_p	p_r@PII$_{max}$	(MPa)		#					
	d_{eq} at max. I_p	d_{eq}@PII$_{max}$	(cm)						-	
	Focal Length			FL_x	(cm)	5	-	-		15
				FL_y	(cm)	6,55	-	-		6,55
	$I_{pa.a}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)		#					
Operating Control Conditions	B-Imagesector start		(cm)			0,0				0,0
	B-Imagesector end		(cm)			30,0				30,0
	B-Imagesector angle		(Degree)			20,0				20,0
	B-Quality					low				low
	Zoom					1,0				1,0
	Foc. Zones					1				1
	Frequency Setting					penet				penet
	SENS PRI					-				-
	B Tx Power		(%)			1				1
	CFM Box start		(cm)			2,1				18,1
	CFM Box end		(cm)			6,6				22,6
	CFM Box angle		(Degree)			7,6				7,6
	CFM Tx power		(%)			100				100
	Ensemble					31				22
	Line Density					1				10
	Flow Res					high				high
	Velocity Range		(kHz)			7,5				0,1
	CFM Quality					norm				low
	CFM Frequency					high				high

A-1-8 Table for AC2-5 at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: AC2-5

Operating Mode: M-Mode
(Simultaneous B-Mode incl.)

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			(a)		-	-	<1	1,4	1,0
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	-		88	88
	min of $[P_a(z_s), I_{ta.3}(z_s)]$	$[W_{.3}(z_s), I_{TA.3}(z_s)]$	(mW)				#		
	z_s	z_1	(cm)				#		
	z_{bp}	z_{bp}	(cm)				#		
	z_p	z_{sp}	(cm)					3,9	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_p)$	$d_{eq}(z_{sp})$	(cm)					0,8	
	f_{awf}	f_c	(MHz)	#	-	-	#	2,1	2,1
	Dim of A_{aprt}	X	(cm)		-	-	#	3,1	3,1
		Y	(cm)		-	-	#	1,3	1,3
	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					0,8	
	Focal Length		FL_x (cm)		-	-	#		15
			FL_y (cm)		-	-	#		6,55
	$I_{pa.a}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm^2)	#					
Operating Control Conditions	B-Imagesector start		(cm)					0,0	0,0
	B-Imagesector end		(cm)					30,0	30,0
	B-Imagesector angle		(Degree)					68,0	68,0
	Quality							low	low
	Zoom							1,0	1,0
	Foc. Zones							1	1
	Frequency Setting							High	High
	SENS PRI							-	-
	Power		(%)					100	100
	Mode Type							M(Harm)	M(Harm)
	Focal Depth		(cm)					15,0	15,0

A-1-9 Table for AC2-5 at Color Motion Mode (Mc-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: AC2-5 **Operating Mode:** Mc-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	1,2	-	1,6	2,0
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	68		137	137
	min of $[P_a(z_s), I_{ta.3}(z_s)]$	$[W_o(z_s), I_{TA.3}(z_s)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{pa}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					1,7	
	z at max. $I_{pa.3}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					1,4	
	f_{awf}	f_c	(MHz)	#	-	3,7	-	2,6	3,6
	Dim of A_{aprt}		X (cm)		-	0,7	-	2,2	1,8
			Y (cm)		-	1,3	-	1,3	1,3
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#				1.0	
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)						
	Focal Length		FL_x (cm)		-	5	-		12
			FL_y (cm)		-	6.55	-		6.55
	$I_{pa.3}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm^2)	#					
Operating Control Conditions	B-Imagesector start		(cm)			0,0		0,0	0,0
	B-Imagesector end		(cm)			5,0		30,0	30,0
	B-Imagesector angle		(Degree)			20		68	20
	B-Quality					low		low	low
	Zoom					1,0		1,0	1,0
	Foc. Zones					1		1	1
	Frequency Setting					penet		penet	penet
	SENS PRI					-		-	-
	B Tx Power		(%)			1		1	1
	Mc Tx Power		(%)			100		100	100
	Ensemble					8		8	8
	Flow Res					high		high	high
	Velocity Range		(kHz)			1,8		1,3	0,9
	Speed					5		5	5
	Mc Frequency					High		Mid	High

A-1-10 Table for AC2-5 at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: AC2-5 **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS		TIB	TIC
					scan	non-scan		
						A_{aprt}≤1	A_{aprt}>1	non-scan	
Global Maximum Index Value				(a)	-	1.5	-	2,0	2,0
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r.a}$	$p_{r.3}$	(MPa)	#					
	P	W_0	(mW)		-	88		103	137
	min of $[P_a(z_1), I_{ta.a}(z_1)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					3,3	
	z at max. $I_{pa.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,7	
	f_{awf}	f_c	(MHz)	#	-	3,7	-	2.0	3,6
	Dim of A_{aprt}		X (cm)		-	0,7	-	1,8	1,8
			Y (cm)		-	1,3	-	1,3	1,3
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	#					
	d_{eq} at max. I_p	d_{eq}@PII$_{max}$	(cm)					0,6	
Focal Length			FL_x (cm)		-	5	-		12
			FL_y (cm)		-	6,55	-		6,55
	$I_{pa.a}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	#					
Operating Control Conditions	Gate width		(cm)			0,5		1,5	0,1
	Gate pos		(cm)			0,3		6,5	6,0
	B-Imagesector angle		(Degree)			1,3		1,3	1,3
	Power		(%)			100		100	100

A-1-11 Table for 4C-A at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: 4C-A **Operating Mode:** B-Mode

Index Label				MI	TIS		TIB	TIC
					scan	non-scan $A_{aprt} \leq 1$	non-scan $A_{aprt} > 1$	non-scan	
Global Maximum Index Value				1,3	(a)	-	-	-	(a)
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_a	$p_{r.3}$	(MPa)	1,8					
	P	W_o	(mW)		#	-		-	#
	min of $[P_a(z_s), I_{ta}(z_s)]$	$[W_o(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{ap}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	6,1					
	$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2,0	#	-	-	-	#
	Dim of A_{aprt}	X	(cm)		#	-	-	-	#
		Y	(cm)		#	-	-	-	#
Other Information	t_d	PD	(µsec)	1,0					
	prr	PRF	(Hz)	4430					
	p_r at max. I_{pa}	$p_r@PII_{max}$	(MPa)	2,6					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length	FL_x	(cm)		#	-	-		#
		FL_y	(cm)		#	-	-		#
	$I_{pa.3}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	190					
Operating Control Conditions	B-Imagesector start		(cm)	0,0					
	B-Imagesector end		(cm)	30,0					
	B-Imagesector angle		(Degree)	20,0					
	Quality			low					
	Zoom			1,0					
	Foc. Zones			1					
	Frequency Setting			CHA					
	SENS PRI			1,0					
	Power		(%)	100					
	ZoomBox start		(cm)	6,0					
	ZoomBox end		(cm)	12,0					
	ZoomBox angle		(Degree)	15,0					
	Mode Type			Contrast					
	Focal Depth		(cm)	7,0					

A-1-12 Table for 4C-A at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: 4C-A **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	<1	-	-	-	1,7
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r.3}$	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		#	-	-	-	204
	min of $[P_a(z_s), I_{TA.3}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	#	#	-	-	-	3,3
	Dim of A_{aprt}	X	(cm)		#	-	-	-	5,2
		Y	(cm)		#	-	-	-	1,3
Other Information	t_d	PD	(usec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length	FL_x	(cm)		#	-	-		18
		FL_y	(cm)		#	-	-		6
	$I_{pa.3}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						0,0
	B-Imagesector end		(cm)						30,0
	B-Imagesector angle		(Degree)						20,0
	B-Quality								low
	Zoom								1,0
	Foc. Zones								1
	Frequency Setting								norm
	SENS PRI								-
	B Tx Power		(%)						1
	CFM Box start		(cm)						14,9
	CFM Box end		(cm)						19,4
	CFM Box angle		(Degree)						7,1
	CFM Tx power		(%)						100
	Ensemble								22
	Line Density								10
	Flow Res								low
	Velocity Range		(kHz)						0,1
	CFM Quality								low
	CFM Frequency								high

A-1-13 Table for 4C-A at Continuous Wave Doppler (CW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: 4C-A **Operating Mode:** Continues Wave

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	-	<1	1,0	1,3
Assoc. Acoustic Parameter	IEC	FDA	Units						
		p_{ra}	(MPa)	#					
	P	W_o	(mW)		-	-		59	59
	min of $[P_a(z_s), I_{ta,3}(z_s)]$	$[W_{.3}(z_1), I_{PA.3}(z_1)]$	(mW)				#		
	z_s	z_1	(cm)				#		
	z_{bp}	z_{bp}	(cm)				#		
	z_p	z_{sp}	(cm)					4,0	
	z at max. $I_{pi.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,7	
	f_{awf}	f_c	(MHz)	#	-	-	#	2,0	2,0
	Dim of A_{aprt}		X (cm)		-	-	#	0,8	0,8
			Y (cm)		-	-	#	1,3	1,3
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,7	
	Focal Length		FL_x (cm)		-	-	#		5
			FL_y (cm)		-	-	#		6
	$I_{ta.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions									
	Velocity Range		(kHz)					12,0	12,0
	Power		(%)					100	100

A-1-14 Table for 4C-A at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: 4C-A

Operating Mode: M-Mode
(Simultaneous B-Mode incl.)

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	-	<1	1.2	<1
Assoc. Acoustic Parameter	IEC	$p_{r.3}$	(MPa)	#					
		P	W_o	(mW)		-	-	93	#
		min of $[P_a(z_s), I_{ta.a}(z_s)]$	$[W_{.3}(z_1), I_{Pa.3}(z_1)]$	(mW)			#		
		z_s	z_1	(cm)			#		
		z_{sp}	z_{sp}	(cm)			#		
		z_b	z_{sp}	(cm)				4.5	
		z at max. $I_{x.a}$	z_{sp}	(cm)	#				
		$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)				0.9	
		f_{awf}	f_c	(MHz)	#	-	#	2.1	#
		Dim of A_{aprt}	X	(cm)		-	#	4.6	#
			Y	(cm)		-	#	1.3	#
Other Information		t_d	PD	(µsec)	#				
		prr	PRF	(Hz)	#				
		p_r at max. I_{pa}	$p_r@PII_{max}$	(MPa)	#				
		d_{eq} at max. I_{pa}	$d_{eq}@PII_{max}$	(cm)				0.8	
		Focal Length	FL_x	(cm)		-	#		#
			FL_y	(cm)		-	#		#
		$I_{pa.a}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	#				
Operating Control Conditions		B-Imagesector start		(cm)				0.0	
		B-Imagesector end		(cm)				30.0	
		B-Imagesector angle		(Degree)				57.6	
		Quality						low	
		Zoom						1.0	
		Foc. Zones						1	
		Frequency Setting							
		SENS PRI						-	
		Power		(%)				85	
		Mode Type						M	
		Focal Depth		(cm)				18.0	

A-1-15 Table for 4C-A at Color Motion Mode (Mc-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: *4C-A*

Operating Mode: Mc-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	-	<1	1,7	1,7
Assoc. Acoustic Parameter	IEC	FDA	Units						
		$p_{r.3}$	(MPa)	#					
		P	(W_o)	(mW)	-	-	#	100	168
	min of $[P_a(z_s), I_{ta.3}(z_s)]$	$[W_{.3}(z_1), I_{ TA.3}(z_1)]$	(mW)				#		
	z_s	z_1	(cm)				#		
	z_{bp}	z_{bp}	(cm)				#		
	z_b	z_{sp}	(cm)					3,7	
	z at max. I_{ta}	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,8	
	f_{awf}	f_c	(MHz)	#	-	-	#	2,0	3,3
	Dim of A_{aprt}		X (cm)		-	-	#	4,4	3,6
			Y (cm)		-	-	#	1,3	1,3
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,7	
	Focal Length		FL_x (cm)		-	-	#		15
			FL_y (cm)		-	-	#		6
	$I_{ta.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm^2)	#					
Operating Control Conditions	B-Imagesector start		(cm)					0,0	0,0
	B-Imagesector end		(cm)					30,0	30,0
	B-Imagesector angle		(Degree)					20	58
	B-Quality							low	low
	Zoom							1,0	1,0
	Foc. Zones							1	1
	Frequency Setting							norm	norm
	SENS PRI							-	-
	B Tx Power		(%)					1	1
	Mc Tx Power		(%)					100	100
	Ensemble							16	8
	Flow Res							high	high
	Velocity Range		(kHz)					0,9	1,3
	Speed							5	5
	Mc Frequency							Low	High

A-1-16 Table for 4C-A at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: 4C-A **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum index Value				(a)	-	-	<1	1,7	1,7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_0	(mW)		-	-		90	169
	min of $[P_a(z_s), I_{ta.a}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				#		
	z_s	z_1	(cm)				#		
	z_{bp}	z_{bp}	(cm)				#		
	z_b	z_{sp}	(cm)					4,7	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_{sp})$	$d_{eq}(z_{sp})$	(cm)					0,5	
	f_{awf}	f_c	(MHz)	#	-	-	#	2,4	3,2
	Dim of A_{aprt}	X	(cm)		-	-	#	1,6	3,6
		Y	(cm)		-	-	#	1,3	1,3
	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					0,5	
Other Information	Focal Length	FL_x	(cm)		-	-	#		15
		FL_y	(cm)		-	-	#		6
	$I_{pa.a}$ at max. MI	$I_{pA.3}@MI_{max}$	(W/cm^2)	#					
Operating Control Conditions	Gate width		(cm)					0,1	0,1
	Gate pos		(cm)					3,0	9,0
	B-Image sector angle		(Degree)					2,2	1,3
	Power		(%)					100	100

A-1-17 Table for IC5-9 at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: IC5-9 **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,1	(a)	-	-	-	(a)
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	2,7					
	P	W_o	(mW)		#	-		-	#
	min of $[P_a(z_s), I_{ta.a}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{sp}	z_{sp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	0,7					
	$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5,8	#	-	-	-	#
	Dim of A_{aprt}	X	(cm)		#	-	-	-	#
		Y	(cm)		#	-	-	-	#
Other Information	t_d	PD	(µsec)	0,2					
	prr	PRF	(Hz)	7010					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	3,1				-	
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)						
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{ta.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	521					
Operating Control Conditions	B-Imagesector start		(cm)	0,0					
	B-Imagesector end		(cm)	16,0					
	B-Imagesector angle		(Degree)	146,31					
	Quality			high					
	Zoom			1,0					
	Foc. Zones			1					
	Frequency Setting			norm					
	SENS PRI			-					
	Power		(%)	100					
	ZoomBox start		(cm)	0,0					
	ZoomBox end		(cm)	3,2					
	ZoomBox angle		(Degree)	146,31					
	Mode Type			B					
	Focal Depth		(cm)	1,0					

A-1-18 Table for IC5-9 at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: IC5-9 **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1	A_{aprt}>1		
Global Maximum Index Value				(a)	<1	-	-	-	1,5
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
		$p_{r.3}$	(MPa)	#					
		W_o	(mW)		#	-	-	-	109
	min of $[P_a(z_1), I_{ta.3}(z_2)]$	$[W_o(z_1), I_{TA.3}(z_1)]$	(mW)						
	z_s	z_1	(cm)				-		
	z_{ap}	z_{ap}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	#	#	-	-	-	5,8
	Dim of A_{aprt}	X	(cm)		#	-	-	-	4,1
		Y	(cm)		#	-	-	-	0,6
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p. at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length	FL_x	(cm)		#	-	-		8
		FL_y	(cm)		#	-	-		3
	$I_{pa.3}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						0,0
	B-Imagesector end		(cm)						16,0
	B-Imagesector angle		(Degree)						146,31
	B-Quality								low
	Zoom								1,0
	Foc. Zones								1
	Frequency Seting								norm
	SENS PRI								-
	B Tx Power		(%)						1
	CFM Box start		(cm)						10,77
	CFM Box end		(cm)						13,17
	CFM Box angle		(Degree)						146,31
	CFM Tx power		(%)						100
	Ensemble								9
	Line Density								2
	Flow Res								high
	Velocity Range		(kHz)						4,0
	CFM Quality								high

A-1-19 Table for IC5-9 at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: IC5-9 **Operating Mode:** M-Mode
(Simultaneous B-Mode incl.)

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum index Value				(a)	-	<1	-	<1	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	#		#	#
	min of $[P_a(z_s), I_{ta.3}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{sp}	(cm)				-		
	z_b	z_{sp}	(cm)					#	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_{sp})$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	#	-	#	#
	Dim of A_{aprt}	X	(cm)		-	#	-	#	#
		Y	(cm)		-	#	-	#	#
Other information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	#	-		#
			FL_y (cm)		-	#	-		#
	$I_{ta.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	Power		(%)						
	Mode Type								
	Focal Depth		(cm)						

A-1-20 Table for IC5-9 at Color Motion Mode (Mc-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: IC5-9 **Operating Mode:** Mc-Mode

Index Label				MI	TIS		TIB	TIC
					scan	non-scan	non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$	
Global Maximum index Value				(a)	-	1,2	-	1,0	1,1
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	43	-	13	43
	min of $[P_a(z_a), I_{ta,a}(z_a)]$	$[W_o(z_1), I_{TA.3}(z_1)]$	(mW)						
	z_a	z_1	(cm)				-		
	z_{ap}	z_{ap}	(cm)				-		
	z_b	z_{sp}	(cm)					0,8	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_a)$	$d_{eq}(z_{sp})$	(cm)					0,2	
	f_{awf}	f_c	(MHz)	#	-	5,8	-	5,9	5,8
	Dim of A_{aprt}	X	(cm)		-	1,4	-	0,4	1,4
		Y	(cm)		-	0,6	-	0,6	0,6
Other Information	t_d	PD	(μsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,2	
	Focal Length		FL_x (cm)		-	8	-		8
			FL_y (cm)		-	3	-		3
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm^2)	#					
Operating Control Conditions	B-image sector start		(cm)			0,0		0,0	0,0
	B-image sector end		(cm)			16,0		16,0	16,0
	B-image sector angle		(Degree)			146,31		146,31	146,31
	B-Quality					low		low	low
	Zoom					1,0		1,0	1,0
	Foc. Zones					1		1	1
	Frequency Setting					norm		norm	norm
	SENS PRI					-		-	-
	B Tx Power		(%)			1		1	1
	Mc Tx Power		(%)			100		100	100
	Ensemble					12		8	12
	Flow Res					high		high	high
	Velocity Range		(kHz)			3,2		2,4	3,2
	Speed					5		5	5
	Mc Frequency					Mid		Mid	Mid

A-1-21 Table for IC5-9 at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: IC5-9 **Operating Mode:** Pulsed Doppler

Index Label			MI	TIS		TIB	TIC
				scan	non-scan	non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$	
Global Maximum Index Value			(a)	-	1,5	-	1,5	1,5
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**					
	p_{ra}	$p_{.3}$	(MPa)	#				
	P	W_o	(mW)		-	45		55	56
	min of $[P_a(z_1), I_{ta,a}(z_1)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{ap}	z_{sp}	(cm)				-		
	z_b	z_{sp}	(cm)					0,7	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,6	
	f_{awf}	f_c	(MHz)	#	-	7,1	-	5,0	5,8
	Dim of A_{aprt}	X	(cm)		-	1,4	-	1,4	1,2
		Y	(cm)		-	0,6	-	0,6	0,6
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,5	
	Focal Length		FL_x (cm)		-	8	-		6
			FL_y (cm)		-	3	-		3
	$I_{pa,a}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	#					
Operating Control Conditions	Gate width		(cm)			1,0		1,5	0,4
	Gate pos		(cm)			3,5		8,0	1,76
	B-Imagesector angle		(Degree)			1,3		5,5	1,3
	Power		(%)			100		100	100

A-1-22 Table for IC5-9H at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: IC5-9H **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1.3	(a)	-	-	-	(a)
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{.3}$	(MPa)	2.7					
	P	W_o	(mW)		#	-	-	-	#
	min of $[P_a(z_s), I_{ta,a}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{sp}	z_{sp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	2.1					
	$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4.5	#	-	-	-	#
	Dim of A_{aprt}		X (cm)		#	-	-	-	#
			Y (cm)		#	-	-	-	#
Other Information	t_d	PD	(µsec)	0.3					
	prr	PRF	(Hz)	2060					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	3.5					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{ta,a}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	212					
Operating Control Conditions	B-Imagesector start		(cm)	0.0					
	B-Imagesector end		(cm)	16.0					
	B-Imagesector angle		(Degree)	20.0					
	Quality			low					
	Zoom			1.0					
	Foc. Zones			1					
	Frequency Setting			norm					
	SENS PRI			-					
	Power		(%)	100					
	ZoomBox start		(cm)	12.3					
	ZoomBox end		(cm)	15.5					
	ZoomBox angle		(Degree)	15.0					
	Mode Type			B					
	Focal Depth		(cm)	4.0					

A-1-23 Table for IC5-9H at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: IC5-9H **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	1.1	-	-	-	1.7
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r.3}$	$p_{r.3}$	(MPa)	#					
	P	$W_{.3}$	(mW)		105	-	-	-	116
	min of $[P_a(z_s), I_{ta.a}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{ap}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	#	7.2	-	-	-	4.9
	Dim of A_{aprt}	X	(cm)		3.2	-	-	-	3.6
		Y	(cm)		0.6	-	-	-	0.6
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_pa	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_pi	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		1	-	-		4
			FL_y (cm)		3.5	-	-		3.5
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)		0,0				0,0
	B-Imagesector end		(cm)		16,0				16,0
	B-Imagesector angle		(Degree)		146,3				146,3
	B-Quality				low				low
	Zoom				1,0				1,0
	Foc. Zones				1				1
	Frequency Setting				norm				norm
	SENS PRI				-				-
	B Tx Power		(%)		1				1
	CFM Box start		(cm)		0,0				2,3
	CFM Box end		(cm)		2,4				4,7
	CFM Box angle		(Degree)		146,3				146,3
	CFM Tx power		(%)		100				100
	Ensemble				31				7
	Line Density				2				9
	Flow Res				low				low
	Velocity Range		(kHz)		0.1				0.1
	CFM Quality				high				low
	CFM Frequency				high				low

A-1-24 Table for IC5-9H at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: IC5-9H **Operating Mode:** M-Mode (Simultaneous B-Mode incl.)

	Index Label			MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum	Index Value			(a)	-	<1	-	<1	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
		$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	#		#	#
	min of $[P_a(z_1), I_{ta.a}(z_1)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{ap}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					#	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	#	-	#	#
	Dim of A_{aprt}		X (cm)		-	#	-	#	#
			Y (cm)		-	#	-	#	#
Other Information	t_d	PD	(μsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	#	-		#
			FL_y (cm)		-	#	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	Power		(%)						
	Mode Type								
	Focal Depth		(cm)						

A-1-25 Table for IC5-9H at Color Motion Mode (Mc-Mode))

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: IC5-9H **Operating Mode:** Mc-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan $A_{aprt} \leq 1$	$A_{aprt} > 1$	non-scan	
Global Maximum index Value				(a)	-	1,5	-	1,3	1,2
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	45	-	14	50
	min of $[P_a(z_s), I_{ta.3}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)						
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					0,7	
	z at max. $I_{pi.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,2	
	f_{awf}	f_c	(MHz)	#	-	7,1	-	5,9	5,0
	Dim of A_{aprt}		X (cm)		-	1,4	-	0,4	1,4
			Y (cm)		-	0,6	-	0,6	0,6
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p. at max. I_p	$p_.@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,2	
	Focal Length		FL_x (cm)		-	8	-		8
			FL_y (cm)		-	3,5	-		3,5
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm^2)	#					
Operating Control Conditions	B-Imagesector start		(cm)			0,0		0,0	0,0
	B-Imagesector end		(cm)			16,0		3,0	16,0
	B-Imagesector angle		(Degree)			20		20	20
	B-Quality					low		low	low
	Zoom					1,0		1,0	1,0
	Foc. Zones					1		1	1
	Frequency Setting					norm		norm	norm
	SENS PRI					-		-	-
	B Tx Power		(%)			1		1	1
	Mc Tx Power		(%)			100		100	100
	Ensemble					12		16	8
	Flow Res					high		high	high
	Velocity Range		(kHz)			2,4		0,9	2,4
	Speed					4		4	4
	Mc Frequency					High		Mid	Low

A-1-26 Table for IC5-9H at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: IC5-9H **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS		TIB	TIC
					scan	non-scan $A_{aprt} \leq 1$	$A_{aprt} > 1$	non-scan	
Global Maximum index Value				(a)	-	1,7	-	1,7	1,7
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	63		70	70
	min of $[P_a(z_s), I_{ta.a}(z_s)]$	$[W_o(z_1), I_{TA.a}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{sp}	(cm)				-		
	z_b	z_{sp}	(cm)					0,2	
	z at max. $I_{pa.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_{sp})$	$d_{eq}(z_{sp})$	(cm)					0,9	
	f_{awf}	f_c	(MHz)	#	-	5,8	-	5,0	5,0
	Dim of A_{aprt}		X (cm)		-	1,2	-	1,4	1,4
			Y (cm)		-	0,6	-	0,6	0,6
	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#					
Other Information	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,6	
	Focal Length		FL_x (cm)		-	6	-		8
			FL_y (cm)		-	3,5	-		3,5
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	Gate width		(cm)			0.1		1.5	1.5
	Gate pos		(cm)			3,2		3,7	3,7
	B-Imagesector angle		(Degree)			7		3,3	3,3
	Power		(%)			100		100	100

A-1-27 Table for SP4-10 at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3

Transducer Model: SP4-10 **Operating Mode:** B-Mode

Index Label			MI	TIS			TIB	TIC
				scan	non-scan		non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			1,3	(a)	-	-	-	(a)
Acoustic Parameter	Assoc.	$p_{r.3}$	(MPa)	2,4					
		W_o	(mW)		#	-		-	#
		min of $[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
		z_1	(cm)				-		
		z_{bp}	(cm)				-		
		z_{sp}	(cm)	0,8				-	
		$d_{eq}(z_{sp})$	(cm)					-	
		f_c	(MHz)	3,3	#	-	-	-	#
		Dim of A_{aprt}	X (cm)		#	-	-	-	#
			Y (cm)		#	-	-	-	#
Other Information		PD	(µsec)	0,5					
		PRF	(Hz)	11420					
		p_r@PII$_{max}$	(MPa)	2,4					
		d_{eq}@PII$_{max}$	(cm)					-	
		Focal	FLx (cm)		#	-	-		#
		Length	FLy (cm)		#	-	-		#
		$I_{PA.3}$@MI$_{max}$	(W/cm²)	200					
Operating Control Conditions		Tx frequency	(MHz)	3,3					
		Tx focus	(cm)	1					
		Tx power		1					
		Quality		high					
		Box start		0,0					
		Box end		2,8					
		Box width	(cm)	2,75					
		B-Imagesector width	(cm)	4,58					
		Frequency Setting		B(Harm)					

A-1-28 Table for SP4-10 at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3

Transducer Model: SP4-10 **Operating Mode:** Color Flow

Index Label			MI	TIS			TIB	TIC
				scan	non-scan		non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		(a)		1,6	-	-	-	2,0
Assoc. Acoustic Parameter	$p_{r.3}$	(MPa)	#					
	W_o	(mW)		74	-		-	93
	min of $[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_1	(cm)				-		
	z_{ap}	(cm)				-		
	z_{sp}	(cm)	#				-	
	$d_{eq}(z_{sp})$	(cm)					-	
	f_c	(MHz)	#	4,9	-	-	-	4,8
	Dim of A_{aprt}	X (cm)		1.2	-	-	-	1,5
		Y (cm)		0,7	-	-	-	0,7
Other Information	PD	(µsec)	#					
	PRF	(Hz)	#					
	p_r@PII$_{max}$	(MPa)	#					
	d_{eq}@PII$_{max}$	(cm)					-	
	Focal Length	FLx (cm)		1	-	-		2
		FLy (cm)		3,25	-	-		3,25
	$I_{PA.3}$ @MI$_{max}$		#					
Operating Control Conditions	Tx frequency	(MHz)		5,0				5,0
	Tx focus	(cm)		1				2
	Tx power			-6				-8
	Ensemble			26				9
	Line Density			10				10
	Velocity Range	(kHz)		15,5				13,0
	Quality			norm				high
	CFM Box start	(cm)		0,0				0,9
	CFM Box end	(cm)		2,1				1,4
	CFM Box witdh	(cm)		0,69				0,92
	B Image width	(cm)		0,92				0,92

A-1-29 Table for SP4-10 at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3

Transducer Model: SP4-10 **Operating Mode:** Pulsed Doppler

Index Label			MI	TIS			TIB	TIC
				scan	non-scan		non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		(a)		1,5	-	1,2	2,0	1,9
Assoc. Acoustic Parameter	$p_{r.3}$	(MPa)	#					
	W_o	(mW)		82	-		105	105
	min of [$W_3(z_1)$, $I_{TA.3}(z_1)$]	(mW)				52		
	z_1	(cm)				2,1		
	z_{pp}	(cm)				2,0		
	z_{sp}	(cm)	#				0,4	
	$d_{eq}(z_{sp})$	(cm)					1,1	
	f_c	(MHz)	#	4,8	-	4,9	4,9	4,9
	Dim of A_{aprt}	X (cm)		0,3	-	2,1	2,1	2,1
		Y (cm)		0,7	-	0,7	0,7	0,7
Other Information	PD	(µsec)	#					
	PRF	(Hz)	#					
	p_r@PII$_{max}$	(MPa)	#					
	d_{eq}@PII$_{max}$	(cm)					0,6	
	Focal Length	FLx (cm)		1	-	6,5		6,5
		FLy (cm)		3,25	-	3,25		3,25
	$I_{PA.3}$ @MI$_{max}$		#					
Operating Control Conditions	Tx frequency	(MHz)		5,0		5,0	5,0	5,0
	Tx focus	(cm)		1		6,5	6,5	6,5
	Tx power			6		-18	-18	-18
	Gate pos	(cm)				2	1,9	1,9
	prf	(kHz)				10,0	10,0	10,0
	Sample Volume (Gate)	(mm)				3	3	3

A-1-30 Table for SP4-10 at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3

Transducer Model: SP4-10 **Operating Mode:** M-Mode (Simultaneous B-Mode incl.)

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	1,5	<1	-	<1	<1
Acoustic Parameter		$p_{r.3}$	(MPa)	#					
		W_0	(mW)		82	#	-	#	#
	Assoc.	min of $[W_3(z_1), I_{TA.3}(z_1)]$	(mW)				-		
		z_1	(cm)				-		
		z_{ip}	(cm)				-		
		z_{sp}	(cm)	#				#	
		$d_{eq}(z_{sp})$	(cm)					#	
		f_c	(MHz)	#	4,8	#	-	#	#
		Dim of A_{aprt}	X (cm)		0,3	#	-	#	#
			Y (cm)		0,7	#	-	#	#
Other Information		PD	(µsec)	#					
		PRF	(Hz)	#					
		p_r@PII$_{max}$	(MPa)	#					
		d_{eq}@PII$_{max}$	(cm)					#	
		Focal	FLx (cm)		1	#	-		#
		Length	FLy (cm)		3,25	#	-		#
		$I_{PA.3}$ @MI$_{max}$		#					
Operating Control		Tx frequency	(MHz)		5,0				
		Tx focus			1				
		Tx power			6				
		Frequency Setting			resol				

A-1-31 Tables for SP6-12 at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: SP6-12 **Operating Mode:** B-Mode

Index Label			MI	TIS			TIB	TIC
				scan	non-scan		non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			1,3	1,4	-	-	-	1,8
	IEC	**FDA**	**Units**					
	$p_{r.\alpha}$	$p_{r.3}$	(MPa)	3,7				
	P	W_o	(mW)		79	-	-	118
	min of $[P_{r.\alpha}(z_s), I_{ta.\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-	
Assoc. Acoustic Parameter	z_s	z_1	(cm)				-	
	z_{bp}	z_{bp}	(cm)				-	
	z_b	z_{sp}	(cm)				-	
	z at max. $I_{pa.\alpha}$	z_{sp}	(cm)	0,5				
	$d_{eq}(z_{sp})$	$d_{eq}(z_{sp})$	(cm)				-	
	f_{awf}	f_c	(MHz)	8,5	8,8	-	-	6,9
	Dim of A_{aprt}		X (cm)		2,4	-	-	5,3
			Y (cm)		0,4	-	-	0,4
Other Information	t_d	PD	(µsec)	0,2				
	prr	PRF	(Hz)	8660				
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	3,2				
	d_{eq} at max. I_p	d_{eq}@PII$_{max}$	(cm)				-	
	Focal Length		FL_x (cm)		6,0	-	-	6,0
			FL_y (cm)		2,0	-	-	2,0
	$I_{pa.\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	415				
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0			0,0
	B-Imagesector end		(cm)	8,0	8,0			8,0
	B-Imagesector width		(cm)	3,7	3,7			3,7
	Quality			high	high			low
	Zoom			1,0	1,0			1,0
	Foc. Zones			1	1			1
	Frequency Setting			resol	resol			norm
	SENS PRI			-	-			-
	Power		(%)	100	100			100
	ZoomBox start		(cm)	0,0	2,7			5,3
	ZoomBox end		(cm)	1,6	4,2			6,9
	ZoomBox width		(cm)	0,8	0,8			3,7
	Mode Type			B	B			B
	Focal Depth		(cm)	0,9	6,0			6,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: SP6-12 **Operating Mode:** B-Mode

Index			MI	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$			
Notation acc. Test Report (DD2)	**Notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	8,5	8,8	-	-	8,8	-	
Output Power	P	(mW)			-	-		-	118
Bounded output Power	P_1	(mW)		33			33		
Attenuated output Power	P_α	(mW)				-		-	
Spatial-peak temporal Average intensity	I_{spta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{spta.\alpha}$	(mW/cm²)				-		-	
Pulse intensity integral	I_{pi}	(mWs/cm²)	0,11					-	
Attenuated pulse intensity integral	$I_{pi.\alpha}$	(mWs/cm²)	0,09					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,2						
Attenuated peak-rarefactional acoustic pressure	$p_{r.\alpha}$	(MPa)	3,7						
12 dB output beam area	A_{aprt}	(cm²)			-	-			2,1
Equivalent aperture Diameter	D_{eq}	(cm)				-			1,6
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi.\alpha}$	(cm)	0,5						

A-1-32 Tables for SP6-12 at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for IEC60601-2-37

(acc. to Table 101)

Transducer Model: SP6-12 **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,3	1,2	-	-	-	1,8
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ix}	$p_{r.3}$	(MPa)	2,9					
	P	W_o	(mW)		54	-		-	105
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{ii,\alpha}$	z_{sp}	(cm)	0,8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5,0	7,3	-	-	-	6,0
	Dim of A_{aprt}		X (cm)		1,5	-	-	-	4,2
			Y (cm)		0,4	-	-	-	0,4
Other Information	t_d	PD	(µsec)	1,0					
	prr	PRF	(Hz)	3730					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	3,2					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		4,5	-	-		2,0
			FL_y (cm)		2,0	-	-		2,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	303					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	8,0	8,0				8,0
	B-Imagesector width		(cm)	3,7	3,7				3,7
	B-Quality			low	low				low
	Zoom			1,0	1,0				1,0
	Foc. Zones			2	2				2
	Frequency Setting			norm	norm				norm
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	4,8	3,4				1,4
	CFM Box end		(cm)	6,0	4,6				2,6
	CFM Box width		(cm)	3,7	0,6				3,7
	CFM Tx power		(%)	100	100				100
	Ensemble			22,0	9,0				7,0
	Line Density			1	2				8
	Flow Res			low	low				low
	Velocity Range		(kHz)	0,1	0,1				13,0
	CFM Quality			low	high				low
	CFM Frequency			low	high				mid

Summary of measured quantities for index determination

(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: SP6-12 **Operating Mode:** Color Flow

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning $A_{aprt} \leq 1$	Non-Scanning $A_{aprt} > 1$	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5,0	7,3	-	-	7,3	-	
Output Power	P	(mW)			-	-		-	105
Bounded output Power	P_1	(mW)		35			35		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,39					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,29					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,9						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			1,6
Equivalent aperture diameter	D_{eq}	(cm)				-			1,4
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0,8						

A-1-33 Tables for SP6-12 at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: SP6-12 **Operating Mode:** B+M-Mode

Index Label				MI	TIS scan	TIS non-scan $A_{aprt} \leq 1$	TIS non-scan $A_{aprt} > 1$	TIB non-scan	TIC
Global Maximum Index Value				1,3	1,3	-	-	-	1,7
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,7					
	P	W_o	(mW)		88	-		-	87
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
Assoc.	z_s	z_1	(cm)				-		
Acoustic	z_{bp}	z_{bp}	(cm)				-		
Parameter	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0,5					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	8,5	8,8	-	-	-	6,8
	Dim of A_{aprt}		X (cm)		1,6	-	-	-	1,2
			Y (cm)		0,4	-	-	-	0,4
	t_d	PD	(µsec)	0,2					
	prr	PRF	(Hz)	900					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	3,2					
Other	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
Information	Focal Length		FL_x (cm)		6,0	-	-		4,5
			FL_y (cm)		2,0	-	-		2,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	415					
	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	8,0	8,0				8,0
	B-Imagesector width		(cm)	3,7	3,7				3,7
	Quality			low	low				low
Operating	Zoom			1,0	1,0				1,0
Control	Foc. Zones			4	1				1
Conditions	Frequency Setting			resol	resol				norm
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	Mode Type			M	M				M
	Focal Depth		(cm)	0,9	6,0				4,5

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: SP6-12 **Operating Mode:** B+M-Mode

Index			MI	TIS Scanning	TIS Non-Scanning $A_{aprt} \leq 1$	TIS Non-Scanning $A_{aprt} > 1$	TIB Scanning	TIB Non-Scanning	TIC
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	8,5	8,8	-	-	8,8	-	
Output Power	P	(mW)			-	-		-	87
Bounded output Power	P_1	(mW)		30			16		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,11					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,09					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,2						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,7						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0,5
Equivalent aperture diameter	D_{eq}	(cm)				-			0,8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0,5						

A-1-34 Tables for SP6-12 at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: SP6-12 **Operating Mode:** Pulsed Doppler

Index Label			MI	TIS		TIB	TIC
				scan	non-scan		non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			1,2	-	1,7	-	1,8	1,6
Assoc. Acoustic Parameter	IEC	FDA	Units					
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,0				
	P	W_o	(mW)	-	48		34	48
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)		-			
	z_s	z_1	(cm)		-			
	z_{sp}	z_{sp}	(cm)		-			
	z_b	z_{sp}	(cm)				0,8	
	z at max. $I_{p,\alpha}$	z_{sp}	(cm)	0,9				
	$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)				0,3	
	f_{awf}	f_c	(MHz)	5,9	-	7,4	-	5,0	7,4
	Dim of A_{aprt}		X (cm)		-	1,2	-	1,2	1,2
			Y (cm)		-	0,4	-	0,4	0,4
Other Information	t_d	PD	(µsec)	0,4					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	3,5					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)				0,3		
Focal Length			FL_x (cm)		-	6,0	-		6,0
			FL_y (cm)		-	2,0	-		2,0
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	405					
Operating Control Conditions	Gate width		(cm)	0,1		0,2		1,0	0,2
	Gate pos		(cm)	0,0		3,2		2,6	3,2
	Velocity Range		(kHz)	1,3		1,3		4,4	1,3
	Power		(%)	100		100		100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7. Table DD.2)

Transducer Model: SP6-12 **Operating Mode:** Pulsed Doppler

Index			MI	TIS		TIS		TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning		Scanning	Non-Scanning	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$				
notation acc. Report (DD2)	Test notation acc. Standard (DD.7)	Units								
Acoustic working frequency	f_{awf}	(MHz)	5,9	-	7,4	-	-	-	5,0	
Output Power	P	(mW)			48	-			34	48
Bounded output Power	P_1	(mW)		-				-		
Attenuated output power	P_α	(mW)				-			25,6	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-			413	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-			310	
pulse intensity integral	I_p	(mWs/cm²)	0,26						0,09	
Attenuated pulse intensity integral	$I_{p,\alpha}$	(mWs/cm²)	0,18						0,07	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,5							
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,0							
-12 dB output beam area	A_{aprt}	(cm²)			0,5	-				0,5
Equivalent aperture diameter	D_{eq}	(cm)				-				0,8
Depth for *TIS*	z_s	(cm)				-				
Depth for *TIB*	z_b	(cm)							0,8	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{p,\alpha}$	(cm)	0,9							

A-1-35 Tables for SP10-16 at 2 D Mode (B-Mode)

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: SP 10-16 **Operating Mode:** B-Mode

Index		MI	TIS	TIS	TIS	TIS	TIB	TIB	TIC
			Scanning	Non-Scanning $A_{aprt} \leq 1$	Non-Scanning $A_{aprt} > 1$	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**						
Acoustic working frequency	f_{awf}	(MHz)	5,6	8,9	-	-	8,9	-	
Output Power	P	(mW)			-	-		-	28
Bounded output Power	P_1	(mW)		5			5		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
Attenuated pulse intensity integral	I_{pi}	(mW/cm²)	0,05					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mW/cm²)	0,03					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,8						
Attenuated peak-rarefactional acoustic	$p_{r,\alpha}$	(MPa)	2,6						
-12 dB output beam area	A_{aprt}	(cm^2)			-	-			1,5
Equivalent aperture diameter	D_{eq}	(cm)				-			1,4
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0,8						

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: SP10-16 **Operating Mode:** B-Mode

Index Label			MI	TIS			TIB	TIC
				scan	non-scan $A_{aprt} \leq 1$	non-scan $A_{aprt} > 1$	non-scan	
Global Maximum Index Value			1,1	0,2	-	-	-	0,5
	IEC	**FDA**	**Units**					
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,6				
	P	W_o	(mW)		13	-	-	28
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_s)]$	(mW)				-	
	z_s	z_1	(cm)					
	z_{bp}	z_{bp}	(cm)				-	
	z_b	z_{sp}	(cm)					-
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0,8				
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-
	f_{awf}	f_c	(MHz)	5,6	8,9	-	-	-	5,3
	Dim of A_{aprt}	X	(cm)		2,5	-	-	-	5,1
		Y	(cm)		0,3	-	-	-	0,3
Other Information	t_d	PD	(µsec)	0,2					
	prr	PRF	(Hz)	10720					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	2,8					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		3,2	-	-		6,0
			FL_y (cm)		1,5	-	-		1,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm^2)	172					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	4,5	4,5				4,5
	B-Imagesector width		(cm)	3,4	3,4				3,4
	Quality			high	low				high
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
	Frequency Setting			penet	norm				High
	SENS PRI			-	-				-
	Power		(%)	100	100				100
	ZoomBox start		(cm)	0,0	3,2				2,6
	ZoomBox end		(cm)	1,0	4,2				3,6
	ZoomBox width		(cm)	2,1	0,8				3,4
	Mode Type			B	B			B(Harm)	
	Focal Depth		(cm)	3,2	3,2				6,0

A-1-36 Tables for SP10-16 at Color Flow Mode (CFM-Mode)

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: SP 10-16 **Operating Mode:** Color Flow

Index		MI	TIS	TIS	TIS	TIB	TIB	TIC
			Scanning	Non-Scanning $A_{aprt} \leq 1$	Non-Scanning $A_{aprt} > 1$	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units						
Acoustic working frequency	f_{awf}	(MHz)	9,7	9,7	-	-	-	
Output Power	P	(mW)		-	-	9,7	-	48
Bounded output Power	P_1	(mW)		10		10		
Attenuated output power	P_α	(mW)			-		-	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)			-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)			-		-	
pulse intensity integral	I_p	(mWs/cm²)	0,36				-	
Attenuated pulse intensity integral	$I_{p,\alpha}$	(mWs/cm²)	0,27				-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4,0					
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,4					
-12 dB output beam area	A_{aprt}	(cm²)		-	-			1,4
Equivalent aperture diameter	D_{eq}	(cm)			-			1,4
Depth for *TIS*	z_s	(cm)			-			
Depth for *TIB*	z_b	(cm)					-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{p,\alpha}$	(cm)	0,4					

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: SP10-16 **Operating Mode:** Color Flow

Index Label			MI	TIS	TIS	TIS	TIB	TIC
				scan	non-scan $A_{aprt} \leq 1$	$A_{aprt} > 1$	non-scan	
Global Maximum Index Value			1,1	0,5	-	-	-	0,9
Assoc. Acoustic Parameter	IEC	Units						
	FDA							
	$p_{r\alpha}$	(MPa)	3,4					
	P	(W_o)		48	-		-	48
	min of $[P, (z_1), I_{\alpha,\alpha}(z_1)]$	($W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)			-		
	z_s	z_1	(cm)			-		
	z_{sp}	z_{sp}	(cm)			-		
	z_b	z_{sp}	(cm)					-
	z at max. $I_{p,\alpha}$	z_{sp}	(cm)	0,4				
	$d_{eq}(z_{sp})$	$d_{eq}(z_{sp})$	(cm)					-
	f_{awf}	f_c	(MHz)	9,7	-	-	-	9,7
	Dim of A_{aprt}	X (cm)		4,8	-	-	-	4,8
		Y (cm)		0,3	-	-	-	0,3
Other Information	t_d	PD	(µsec)	0,5				
	prr	PRF	(Hz)	8520				
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	4,0				
	d_{eq} at max. I_p	d_{eq}@PII$_{max}$	(cm)				-	
	Focal Length		FL_x (cm)		3,2	-	-	3,2
			FL_y (cm)		1,5	-	-	1,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	446				
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0			0,0
	B-Imagesector end		(cm)	4,5	4,5			4,5
	B-Imagesector width		(cm)	3,4	3,4			3,4
	B-Quality			low	low			low
	Zoom			1,0	1,0			1,0
	Foc. Zones			2	2			2
	Frequency Setting			resol	resol			resol
	SENS PRI			-	-			-
	B Tx Power		(%)	1	1			1
	CFM Box start		(cm)	0,0	2,4			2,4
	CFM Box end		(cm)	0,7	3,1			3,1
	CFM Box width		(cm)	3,4	3,4			3,4
	CFM Tx power		(%)	100	100			100
	Ensemble			7,0	31,0			31,0
	Line Density			1	1			1
	Flow Res			high	high			high
	Velocity Range		(kHz)	20,5	13,0			13,0
	CFM Quality			low	norm			norm
	CFM Frequency			high	high			high

A-1-37 Tables for SP10-16 at Motion Mode (M-Mode)

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: SP 10-16 **Operating Mode:** B+M-Mode

Index		MI	TIS	TIS	TIS	TIB	TIB	TIC
			Scanning	Non-Scanning A_{aprt}≤1	Non-Scanning A_{aprt}>1	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units						
Acoustic working frequency	f_{awf}	(MHz)	5,6	8,9	-	8,6	-	
Output Power	P	(mW)			-		-	21
Bounded output Power	P_1	(mW)		6		4		
Attenuated output power	P_α	(mW)			-		-	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)			-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)			-		-	
pulse intensity integral	I_{pi}	(mW/s/cm²)	0,05				-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mW/s/cm²)	0,03				-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,7					
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,6					
-12 dB output beam area	A_{aprt}	(cm²)			-			0,5
Equivalent aperture diameter	D_{eq}	(cm)						0,8
Depth for *TIS*	z_s	(cm)						
Depth for *TIB*	z_b	(cm)					-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0,8					

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: SP10-16 **Operating Mode:** B+M-Mode

Index Label			MI	TIS			TIB	TIC
				scan	non-scan A_{aprt}≤1	non-scan A_{aprt}>1	non-scan	
Global Maximum Index Value			1,1	0,3	-	-	-	0,4
Assoc. Acoustic Parameter	IEC	FDA	Units					
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,6				
	P	W_o	(mW)		19	-	-	21
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_s)$, $I_{TA.3}(z_s)$]	(mW)			-		
	z_s	z_1	(cm)			-		
	z_{bp}	z_{sp}	(cm)			-		
	z_b	z_{sp}	(cm)				-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	0,8				
	$d_{eq}(z_s)$	$d_{aa}(z_{sp})$	(cm)				-	
	f_{awf}	f_c	(MHz)	5,6	8,9	-	-	5,3
	Dim of A_{aprt}	X	(cm)		1,7	-	-	1,7
		Y	(cm)		0,3	-	-	0,3
Other Information	t_{pi}	PD	(µsec)	0,2				
	prr	PRF	(Hz)	900				
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	2,7				
	d_{eq} at max. I_{pi}	$d_{aa}@PII_{max}$	(cm)				-	
Focal Length			FL_x (cm)		3,2	-	-	6,0
			FL_y (cm)		1,5	-	-	1,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	172				
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0			0,0
	B-Imagesector end		(cm)	4,5	4,5			4,5
	B-Imagesector width		(cm)	3,4	3,4			3,4
	Quality			low	low			low
	Zoom			1,0	1,0			1,0
	Foc. Zones			3	1			1
	Frequency Setting			penet	norm			Low
	SENS PRI			-	-			-
	Power		(%)	100	100			100
	Mode Type			M	M			M(Harm)
	Focal Depth		(cm)	3,2	3,2			6,0

A-1-38 Tables for SP10-16 at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: SP10-16 **Operating Mode:** Pulsed Doppler

Index Label			MI	TIS			TIB	TIC
				scan	non-scan		non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum index Value			1,1	-	1,1	-	1,1	0,8
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**					
		$p_{r.3}$	(MPa)	3,1				
	P	W_o	(mW)		-	25	25	25
	min of $[P_a(z_s), I_{ta.3}(z_{ta})]$	$[W_{.3}(z_1), I_{TA.3}(z_c)]$	(mW)			-		
	z_s	z_1	(cm)			-		
	z_{bp}	z_{bp}	(cm)			-		
	z_p	z_{sp}	(cm)				0,6	
	z at max. $I_{pa.a}$	z_{sp}	(cm)	0,8				
	$d_{eq}(z_p)$	$d_{eq}(z_{sp})$	(cm)				0,3	
	f_{awf}	f_c	(MHz)	8,3	-	9,7	-	9,7
	Dim of A_{aprt}		X (cm)		-	1,4	-	1,4	1,4
			Y (cm)		-	0,3	-	0,3	0,3
Other Information	t_d	PD	(µsec)	0,3					
	prr	PRF	(Hz)	1300					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	4,1					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)				0,3		
	Focal Length		FL_x (cm)		-	3,2	-		3,2
			FL_y (cm)		-	1,5	-		1,5
	$I_{pa.a}$ at max. MI	$I_{PA.3}$@MI$_{max}$	(W/cm²)	283					
Operating Control Conditions	Gate width		(cm)	0,1		0,1		0,1	0,1
	Gate pos		(cm)	0,0		1,4		1,4	1,4
	Velocity Range		(kHz)	1,3		4,4		4,4	4,4
	Power		(%)	100		100		100	100

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: SP 10-16 **Operating Mode:** Pulsed Doppler

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$			
notation acc. Report (DD2)	**Test notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	8,3	-	9,7	-	-	9,7	
Output Power	P	(mW)			25	-		25	25
Bounded output Power	P_1	(mW)		-			-		
Attenuated output power	P_α	(mW)				-		16,1	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		341	
Attenuated spatial-peak temporal-average intensity	$I_{zpta.\alpha}$	(mW/cm²)				-		208	
pulse intensity integral	I_{pi}	(mW/cm²)	0,16					0,08	
Attenuated pulse intensity integral	$I_{pi.\alpha}$	(mW/cm²)	0,08					0,05	
Peak-rarefactional acoustic pressure	p_r	(MPa)	4,1						
Attenuated peak-rarefactional acoustic pressure	$p_{r.\alpha}$	(MPa)	3,1						
-12 dB output beam area	A_{aprt}	(cm²)			0,4	-			0,4
Equivalent aperture diameter	D_{eq}	(cm)				-			0,7
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						0,6	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi.\alpha}$	(cm)	0,8						

A-1-39 Table for PA2-5P at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: PA2-5P **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum	Index Value			1,2	(a)	-	-	-	(a)
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	1,6					
	P	W_o	(mW)		#	-		-	#
	min of $[P_a(z_s), I_{ta,a}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{ap}	z_{ap}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	3,2					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	1,9	#	-	-	-	#
	Dim of A_{aprt}	X	(cm)		#	-	-	-	#
		Y	(cm)		#	-	-	-	#
Other Information	t_d	PD	(µsec)	0,9					
	prr	PRF	(Hz)	3050					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	2,0					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{ta,a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	115					
Operating Control Conditions	B-Imagesector start		(cm)	0,0					
	B-Imagesector end		(cm)	23,7					
	B-Imagesector angle		(Degree)	20,0					
	Quality			low					
	Zoom			1,0					
	Foc. Zones			1					
	Frequency Setting			High					
	SENS PRI			-					
	Power		(%)	100					
	ZoomBox start		(cm)	7,9					
	ZoomBox end		(cm)	12,6					
	ZoomBox angle		(Degree)	15,0					
	Mode Type			B(Harm)					
	Focal Depth		(cm)	5,0					

A-1-40 Table for PA2-5P at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: PA2-5P **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan $A_{aprt} \leq 1$	$A_{aprt} > 1$	non-scan	
Global Maximum Index Value				(a)	1,0	-	-	-	1,5
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r.a}$	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		72	-		-	84
	min of $[P_a(z_s), I_{ta.a}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pa.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_{sp})$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	#	2,9	-	-	-	2,8
	Dim of A_{aprt}		X (cm)		0,9	-	-	-	1,3
			Y (cm)		1,15	-	-	-	1,15
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		5	-	-		8
			FL_y (cm)		5,8	-	-		5,8
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)		0,0				0,0
	B-Imagesector end		(cm)		23,7				23,7
	B-Imagesector angle		(Degree)		90,0				20,0
	B-Quality				low				low
	Zoom				1,0				1,0
	Foc. Zones				1				1
	Frequency Setting				norm				norm
	SENS PRI				-				-
	B Tx Power		(%)		1				1
	CFM Box start		(cm)		4,2				5,0
	CFM Box end		(cm)		7,8				8,6
	CFM Box angle		(Degree)		90,0				12,0
	CFM Tx power		(%)		100				100
	Ensemble				22				31
	Line Density				1				10
	Flow Res				low				high
	Velocity Range		(kHz)		6,0				6,0
	CFM Quality				low				norm
	CFM Frequency				high				high

A-1-41 Table for PA2-5P at Color Motion Mode (Mc-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: PA2-5P **Operating Mode:** Mc-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan $A_{aprt} \leq 1$	$A_{aprt} > 1$	non-scan	
Global Maximum Index Value				(a)	-	-	<1	1,5	1,5
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
		p_{ra}	(MPa)	#					
		$p_{r.3}$	(MPa)	#					
		P	W_0 (mW)		-	-	#	56	95
		min of $[P_{a,1}(z_1), I_{ta,1}(z_1)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$ (mW)				#		
		z_s	z_1 (cm)				#		
		z_{ap}	z_{sp} (cm)				#		
		z_b	z_{sp} (cm)					4,0	
		z at max. I_{pa}	z_{sp} (cm)	#					
		$d_{eq}(z_s)$	$d_{eq}(z_{sp})$ (cm)					0,5	
		f_{awf}	f_c (MHz)	#	-	-	#	2,2	2,8
		Dim of A_{aprt}	X (cm)		-	-	#	1,3	1,6
			Y (cm)		-	-	#	1,15	1,15
Other Information		t_d	PD (µsec)	#					
		prr	PRF (Hz)	#					
		p_r at max. I_p	p_r@PII$_{max}$ (MPa)	#					
		d_{eq} at max. I_p	d_{eq}@PII$_{max}$ (cm)					0,4	
		Focal Length	FL_x (cm)		-	-	#		11
			FL_y (cm)		-	-	#		5,8
		$I_{ta,a}$ at max. MI	$I_{PA.3}$ @MI$_{max}$ (W/cm²)	#					
Operating Control Conditions		B-Imagesector start	(cm)					0.0	0,0
		B-Imagesector end	(cm)					23,7	23,7
		B-Imagesector angle	(Degree)					20	20
		B-Quality						low	low
		Zoom						1.0	1,0
		Foc. Zones						1	1
		Frequency Setting						norm	norm
		SENS PRI						-	-
		B Tx Power	(%)					1	1
		Mc Tx Power	(%)					100	100
		Ensemble						8	8
		Flow Res						high	high
		Velocity Range	(kHz)					1,8	0,6
		Speed						5	5
		Mc Frequency						Mid	High

A-1-42 Table for PA2-5P at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: PA2-5P **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum index Value				(a)	-	-	<1	1,5	1,5
Assoc. Acoustic Parameter	IEC	p_{ra}	(MPa)	#					
		P	(mW)		-	-		93	95
		min of $[P_a(z_s), I_{ta,a}(z_s)]$	(mW)				#		
		z_s	(cm)				#		
		z_{bp}	(cm)				#		
		z_{sp}	(cm)					3,5	
		z at max. $I_{pa,a}$	z_{sp}	(cm)	#				
		$d_{eq}(z_{sp})$	(cm)					0,8	
		f_{awf}	(MHz)	#	-	-	#	2,3	2,8
		Dim of A_{aprt}	X (cm)		-	-	#	1,9	1,6
			Y (cm)		-	-	#	1,15	1,15
Other Information		t_d	PD	(µsec)	#				
		prr	PRF	(Hz)	#				
		p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#				
		d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)				0,8	
	Focal Length		FL_x (cm)			-	#		11
			FL_y (cm)			-	#		5,8
		$I_{pa,a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#				
Operating Control Conditions		Gate width		(cm)				0,4	1,0
		Gate pos		(cm)				7,2	0,5
		B-Imagesector angle		(Degree)				2,2	1,3
		Power		(%)				100	100

A-1-43 Table for PA2-5P at Motion Mode (M-Mode))

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: PA2-5P

Operating Mode: M-Mode
(Simultaneous B-Mode incl.)

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	-	<1	<1	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	-		#	#
	min of $[P_\alpha(z_1), I_{\alpha.\alpha}(z_1)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				#		
	z_1	z_1	(cm)				#		
	z_{ap}	z_{bp}	(cm)				#		
	z_b	z_{sp}	(cm)					#	
	z at max. $I_{pa.\alpha}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	-	#	#	#
	Dim of A_{aprt}		X (cm)		-	-	#	#	#
			Y (cm)		-	-	#	#	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	-	#		#
			FL_y (cm)		-	-	#		#
	$I_{pa.\alpha}$ at max. MI	$I_{pa.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	Power		(%)						
	Mode Type								
	Focal Depth		(cm)						

A-1-44 Table for PA6-8 at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: PA6-8 **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,3	(a)	-	-	-	(a)
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	2,4					
	P	W_o	(mW)		#	-		-	#
	min of $[P_a(z_s), I_{ta.a}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_s)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	3,6					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3,1	#	-	-	-	#
	Dim of A_{aprt}		X (cm)		#	-	-	-	#
			Y (cm)		#	-	-	-	#
Other Information	t_d	PD	(µsec)	2,8					
	prr	PRF	(Hz)	1760					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	3,1					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	123					
Operating Control Conditions	B-Imagesector start		(cm)	0,0					
	B-Imagesector end		(cm)	24,0					
	B-Imagesector angle		(Degree)	80,0					
	Quality			low					
	Zoom			1,0					
	Foc. Zones			1					
	Frequency Setting			-					
	SENS PRI			16,0					
	Power		(%)	100					
	ZoomBox start		(cm)	12,0					
	ZoomBox end		(cm)	16,8					
	ZoomBox angle		(Degree)	80,0					
	Mode Type			BFlow					
	Focal Depth		(cm)	5,0					

A-1-45 Table for PA6-8 at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: PA6-8 **Operating Mode:** Color Flow

Index Label					MI	TIS			TIB	TIC
						scan	non-scan		non-scan	
							$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)		1,6	-	-	-	1,9
Assoc. Acoustic Parameter		IEC	FDA	Units						
		$p_{r.3}$	$p_{r.3}$	(MPa)	#					
		P	W_0	(mW)		66	-		-	79
		min of $[P_a(z_1), I_{ta.3}(z_1)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
		z_1	z_1	(cm)				-		
		z_{sp}	z_{sp}	(cm)				-		
		z_b	z_{sp}	(cm)	#				-	
		z at max. I_{pa}	z_{sp}	(cm)	#					
		$d_{eq}(z_1)$	$d_{eq}(z_{sp})$	(cm)					-	
		f_{awf}	f_c	(MHz)	#	5,9	-	-	-	5,9
		Dim of A_{aprt}		X (cm)		1,2	-	-	-	1,4
				Y (cm)		0,6	-	-	-	0,6
Other Information		t_d	PD	(µsec)	#					
		prr	PRF	(Hz)	#					
		p_r at max. I_pa	$p_r@PII_{max}$	(MPa)	#					
		d_{eq} at max. I_pa	$d_{eq}@PII_{max}$	(cm)					-	
		Focal Length		FL_x (cm)		7	-	-		10
				FL_y (cm)		3,65	-	-		3,65
		$I_{ta.3}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions		B-Imagesector start		(cm)		0,0				0,0
		B-Imagesector end		(cm)		13,7				13,7
		B-Imagesector angle		(Degree)		90,0				90,0
		B-Quality				low				low
		Zoom				1,0				1,0
		Foc. Zones				1				1
		Frequency Setting				penet				penet
		SENS PRI				-				-
		B Tx Power		(%)		1				1
		CFM Box start		(cm)		4,9				7,3
		CFM Box end		(cm)		6,9				9,3
		CFM Box angle		(Degree)		90,0				90,0
		CFM Tx power		(%)		100				100
		Ensemble				9				9
		Line Density				10				10
		Flow Res				low				low
		Velocity Range		(kHz)		7,5				6,0
		CFM Quality				high				high
		CFM Frequency				high				high

A-1-46 Table for PA6-8 at Continuous Wave Doppler (CW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: PA6-8 **Operating Mode:** Continues Wave

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	<1	-	<1	<1
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	#		#	#
	min of $[P_a(z_s), I_{ta.a}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_{bp})]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_p	z_{sp}	(cm)					#	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_p)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	#	-	#	#
	Dim of A_{aprt}		X (cm)		-	#	-	#	#
			Y (cm)		-	#	-	#	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	#	-		#
			FL_y (cm)		-	#	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	Velocity Range		(kHz)						
	Power		(%)						

A-1-47 Table for PA6-8 at Color Motion Mode (Mc-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: PA6-8 **Operating Mode:** Mc-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	2,0	-	1,9	1,7
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	71		69	71
	min of $[P_a(z_s), I_{ta.a}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{ap}	z_{ap}	(cm)				-		
	z_b	z_{sp}	(cm)					0,3	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)					0,7	
	f_{awf}	f_c	(MHz)	#	-	5,9	-	5,0	5,9
	Dim of A_{aprt}		X (cm)		-	1,4	-	1,4	1,4
			Y (cm)		-	0,6	-	0,6	0,6
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p. at max. I_p	$p_.@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					0,5	
	Focal Length		FL_x (cm)		-	10	-		10
			FL_y (cm)		-	3,65	-		3,65
	$I_{ta.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)			0,0		0,0	0,0
	B-Imagesector end		(cm)			13,7		13,7	13,7
	B-Imagesector angle		(Degree)			90		20	90
	B-Quality					low		low	low
	Zoom					1,0		1,0	1,0
	Foc. Zones					1		1	1
	Frequency Setting					penet		penet	penet
	SENS PRI					-		-	-
	B Tx Power		(%)			1		1	1
	Mc Tx Power		(%)			100		100	100
	Ensemble					12		8	12
	Flow Res					high		high	high
	Velocity Range		(kHz)			0,9		3,2	0,9
	Speed					5		5	5
	Mc Frequency					High		Mid	High

A-1-48 Table for PA6-8 at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: PA6-8 **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	2,0	-	1,9	1,9
Assoc. Acoustic Parameter	IEC	FDA	Units						
		$p_{r.a}$	(MPa)	#					
		W_o	(mW)		-	71		68	7:1
		min of $[P_a(z_s), I_{ta.a}(z_s)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{ap}	(cm)				-		
	z_b	z_{sp}	(cm)					0,3	
	z at max. $I_{pa.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,7	
	f_{awf}	f_c	(MHz)	#	-	5,9	-	5,0	5,9
	Dim of A_{aprt}		X (cm)		-	1,2	-	1,4	1,2
			Y (cm)		-	0,6	-	0,6	0,6
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_pa	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					0,5	
	Focal Length		FL_x (cm)		-	7	-		7
			FL_y (cm)		-	3,65	-		3,65
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	Gate width		(cm)			0,2		0,7	0,2
	Gate pos		(cm)			1,5		4,3	1,5
	B-Imagesector angle		(Degree)			3,3		2,2	3,3
	Power		(%)			100		100	100

A-1-49 Table for PA6-8 at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: PA6-8

Operating Mode: M-Mode
(Simultaneous B-Mode incl.)

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1	A_{aprt}>1		
Global Maximum Index Value				(a)	-	<1	-	<1	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
		$p_{r.3}$	(MPa)	#					
		W_o	(mW)		-	#		#	#
	min of $[P_a(z_1), I_{ta.a}(z_1)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_1	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					#	
	z at max. $I_{pa.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	#	-	#	#
	Dim of A_{aprt}	X	(cm)		-	#	-	#	#
		Y	(cm)		-	#	-	#	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	p_r@PII$_{max}$	(MPa)	#					
	d_{eq} at max. I_p	d_{eq}@PII$_{max}$	(cm)					#	
	Focal Length	FL_x	(cm)		-	#	-		#
		FL_y	(cm)		-	#	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	Power		(%)						
	Mode Type								
	Focal Depth		(cm)						

A-1-50 Table for PCW4.0 at Continuous Wave Doppler (CW-Mode)

Acoustic Output Reporting Table for Track 3

Transducer Model: PCW4.0 **Operating Mode:** Continues Wave

Index Label			MI	TIS			TIB	TIC
				scan	non-scan		non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			(a)	-	<1	-	1,0	<1
Acoustic Parameter	Assoc.	$p_{r.3}$	(MPa)	#				
		W_o	(mW)		-	#	16	#
		min of $[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)					
		z_1	(cm)				-	
		z_{ap}	(cm)				-	
		z_{sp}	(cm)	#				
		$d_{eq}(z_{sp})$	(cm)				1,1	
		f_c	(MHz)	#	-	#	-	3,9
		Dim of A_{aprt}	X (cm)		-	#	-	0,5
			Y (cm)		-	#	-	0,50
Other Information		PD	(µsec)	#				
		PRF	(Hz)	#				
		p_r@PII_{max}	(MPa)	#				
		d_{eq}@PII_{max}	(cm)				0,3	
		Focal Length	FLx (cm)		-	#	-	#
			FLy (cm)		-	#	-	#
		$I_{PA.3}$ @MI_{max}		#				
Operating Control Conditions		Tx frequency	(MHz)				3,9	
		Tx focus	(cm)				5	
		Tx power					3	

A-1-51 Table for SCW2.0 at Continuous Wave Doppler (CW-Mode)

Acoustic Output Reporting Table for Track 3

Transducer Model: SCW2.0 **Operating Mode:** Continues Wave

Index Label			MI	TIS			TIB	TIC
				scan	non-scan		non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		(a)	-	<1	-	1,2	<1	
Assoc. Acoustic Parameter	$p_{r.3}$	(MPa)	#					
	W_o	(mW)		-	#	28	#	
	min of [$W_3(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_1	(cm)				-		
	z_{bp}	(cm)				-		
	z_{sp}	(cm)	#				0,4	
	$d_{eq}(z_{sp})$	(cm)					0,5	
	f_c	(MHz)	#	-	#	-	2,0	#
	Dim of A_{aprt}	X (cm)		-	#	-	0,9	#
		Y (cm)		-	#	-	0,92	#
Other Information	PD	(µsec)	#					
	PRF	(Hz)	#					
	$p_r@PII_{max}$	(MPa)	#					
	$d_{eq}@PII_{max}$	(cm)					0,5	
	Focal Length	FLx (cm)		-	#	-		#
		FLy (cm)		-	#	-		#
	$I_{PA.3}@MI_{max}$		#					
Operating Control Conditions	Tx frequency	(MHz)					1,9	
	Tx focus	(cm)					5	
	Tx power						-1	

A-1-52 Table for RAB2-5L at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB2-5L **Operating Mode:** B-Mode

Index Label				MI	TIS		TIB	TIC
					scan	non-scan		
						A_{aprt}≤1	A_{aprt}>1	non-scan	
Global Maximum Index Value				1,3	(a)	-	-	-	(a)
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	1,8					
	P	W_0	(mW)		#	-	-	-	#
	min of [$P_a(z_i)$, $I_{ta.3}(z_i)$]	[$W_{.3}(z_i)$, $I_{TA.3}(z_i)$]	(mW)						
	z_s	z_1	(cm)						
	z_{bp}	z_{sp}	(cm)						
	z_b	z_{sp}	(cm)						
	z at max. I_{pa}	z_{sp}	(cm)	3,8					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)						
	f_{awf}	f_c	(MHz)	2,1	#	-	-	-	#
	Dim of A_{aprt}		X (cm)		#	-	-	-	#
			Y (cm)		#	-	-	-	#
Other Information	t_d	PD	(µsec)	0,7					
	prr	PRF	(Hz)	4760					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	2,4					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{pa.3}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	177					
Operating Control Conditions	B-Imagesector start		(cm)	0,0					
	B-Imagesector end		(cm)	24,0					
	B-Imagesector angle		(Degree)	80,0					
	Quality			low					
	Zoom			1,0					
	Foc. Zones			1					
	Frequency Setting			Mid					
	SENS PRI			-					
	Power		(%)	100					
	ZoomBox start		(cm)	6,4					
	ZoomBox end		(cm)	11,2					
	ZoomBox angle		(Degree)	80,0					
	Mode Type			B(Harm)					
	Focal Depth		(cm)	5,0					

A-1-53 Table for RAB2-5L at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB2-5L **Operating Mode:** Color Flow

Index Label				MI	TIS		TIB	TIC
					scan	non-scan		
						A_{aprt}≤1	A_{aprt}>1	non-scan	
Global Maximum Index Value				(a)	<1	-	-	-	1,4
Assoc. Acoustic Parameter		**IEC**	**FDA**	**Units**					
			$p_{r.3}$	(MPa)					
			W_0	(mW)		#	-	-	201
		min of [$P_a(z_1)$, $I_{ta.a}(z_1)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)			-		
		z_1		(cm)			-		
		z_{ap}		(cm)			-		
		z_{sp}		(cm)				-	
		z at max. I_{pa}	z_{sp}	(cm)	#				
		$d_{eq}(z_{sp})$		(cm)				-	
		f_{awf}		(MHz)	#	#	-	-	3,6
		Dim of A_{aprt}		X (cm)		#	-	-	8,1
				Y (cm)		#	-	-	1,3
Other Information		t_d	PD	(µsec)	#				
		prr	PRF	(Hz)	#				
		p_r at max. I_p	p_r@PII$_{max}$	(MPa)	#				
		d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)				-	
		Focal Length		FL_x (cm)		#	-	-	15
				FL_y (cm)		#	-	-	7
		$I_{pa.a}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	#				
Operating Control Conditions		B-Imagesector start		(cm)					0,0
		B-Imagesector end		(cm)					24,0
		B-Imagesector angle		(Degree)					80,0
		B-Quality							low
		Zoom							1,0
		Foc. Zones							1
		Frequency Setting							penet
		SENS PRI							-
		B Tx Power		(%)					1
		CFM Box start		(cm)					13,6
		CFM Box end		(cm)					17,2
		CFM Box angle		(Degree)					80,0
		CFM Tx power		(%)					100
		Ensemble							31
		Line Density							1
		Flow Res							low
		Velocity Range		(kHz)					3,2
		CFM Quality							norm
		CFM Frequency							high

A-1-54 Table for RAB2-5L at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB2-5L

Operating Mode: M-Mode
(Simultaneous B-Mode incl.)

Index Label				MI	TIS		TIB	TIC
					scan	non-scan	non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	<1	-	<1	<1	<1
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		#	-	#	#	#
	min of $[P_a(z_i), I_{ta.3}(z_i)]$	$[W_{.3}(z_1), I_{PA.3}(z_1)]$	(mW)				#		
	z_s	z_1	(cm)				#		
	z_{bp}	z_{bp}	(cm)				#		
	z_p	z_{sp}	(cm)					#	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	#	-	#	#	#
	Dim of A_{aprt}		X (cm)		#	-	#	#	#
			Y (cm)		#	-	#	#	#
Other Information	t_d	PD	(μsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	p_t@PII$_{max}$	(MPa)	#					
	d_{eq} at max. I_p	d_{eq}@PII$_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		#	-	#	#	#
			FL_y (cm)		#	-	#		
	$I_{pa.a}$ at max. MI	$I_{PA.3}$@MI$_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	Power		(%)						
	Mode Type								
	Focal Depth		(cm)						

A-1-55 Table for RAB2-5L at Color Motion Mode (Mc-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB2-5L **Operating Mode:** Mc-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan $A_{aprt} \leq 1$	$A_{aprt} > 1$	non-scan	
Global Maximum Index Value				(a)	<1	-	<1	1,0	<1
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		#	-		33	#
	min of $[P_a(z_s), I_{ta.3}(z_s)]$	$[W_o(z_1), I_{PA.3}(z_1)]$	(mW)				#		
	z_s	z_1	(cm)				#		
	z_{bp}	z_{bp}	(cm)				#		
	z_b	z_{sp}	(cm)					4,6	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,4	
	f_{awf}	f_c	(MHz)	#	#	-	#	2,1	#
	Dim of A_{aprt}		X (cm)		#	-	#	1,6	#
			Y (cm)		#	-	#	1,3	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p. at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					0,4	
	Focal Length		FL_x (cm)		#	-	#		#
			FL_y (cm)		#	-	#		#
	$I_{ta.3}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)					0.0	
	B-Imagesector end		(cm)					24.0	
	B-Imagesector angle		(Degree)					80	
	B-Quality							low	
	Zoom							1.0	
	Foc. Zones							1	
	Frequency Setting							penet	
	SENS PRI							-	
	B Tx Power		(%)					1	
	Mc Tx Power		(%)					100	
	Ensemble							8	
	Flow Res							high	
	Velocity Range		(kHz)					0,6	
	Speed							5	
	Mc Frequency							Low	

A-1-56 Table for RAB2-5L at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB2-5L **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt}\leq 1$	$A_{aprt}>1$		
Global Maximum	Index Value			(a)	<1	-	<1	1,7	1,3
	IEC	**FDA**	**Units**						
		$p_{r.a}$	(MPa)	#					
		W_o	(mW)		#	-		99	106
		min of $[P_a(z_1), I_{ta.3}(z_1)]$	(mW)				#		
Assoc. Acoustic Parameter		z_s	(cm)				#		
		z_{bp}	(cm)				#		
		z_{sp}	(cm)					4,2	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_{sp})$		(cm)					0,7	
	f_{awf}	f_c	(MHz)	#	#	-	#	2,0	3,6
	Dim of A_{aprt}		X (cm)		#	-	#	2,5	2,5
			Y (cm)		#	-	#	1,3	1,3
	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
Other Information	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,7	
	Focal Length		FL_x (cm)		#	-	#		15
			FL_y (cm)		#	-	#		7
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	Gate width		(cm)					0,1	0,5
	Gate pos		(cm)					9,61	9,65
	B-Imagesector angle		(Degree)					1,3	2,2
	Power		(%)					100	100

A-1-57 Table for RAB4-8L at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB4-8L **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,3	(a)	-	-	-	(a)
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	2,1					
	P	W_o	(mW)		#	-		-	#
	min of $[P_a(z_1), I_{ta,a}(z_1)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)						
	z_s	z_1	(cm)				-		
	z_{pa}	z_{sp}	(cm)				-		
	z_b	z_{ap}	(cm)					-	
	z at max. $I_{pa.a}$	z_{sp}	(cm)	2,8					
	$d_{eq}(z_s)$	$d_{eq}(z_{1p})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2,9	#	-	-	-	#
	Dim of A_{aprt}	X	(cm)		#	-	-	-	#
		Y	(cm)		#	-	-	-	#
Other Information	t_d	PD	(µsec)	0,5					
	prr	PRF	(Hz)	2800					
	p_r at max. I_pa	$p_r@PII_{max}$	(MPa)	2,7					
	d_{eq} at max. I_pa	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{ta.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	246					
Operating Control Conditions	B-Imagesector start		(cm)	0,0					
	B-Imagesector end		(cm)	22.0					
	B-Imagesector angle		(Degree)	20.0					
	Quality			low					
	Zoom			1.0					
	Foc. Zones			1					
	Frequency Setting			High					
	SENS PRI			-					
	Power		(%)	100					
	ZoomBox start		(cm)	8,8					
	ZoomBox end		(cm)	13.2					
	ZoomBox angle		(Degree)	20.0					
	Mode Type			B(Harm)					
	Focal Depth		(cm)	3.0					

A-1-58 Table for RAB4-8L at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB4-8L **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan $A_{aprt} \leq 1$	$A_{aprt} > 1$	non-scan	
Global Maximum Index Value				(a)	<1	-	-	-	<1
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	$W_{.3}$	(mW)		#	-		-	#
	min of $[P_a(z_s), I_{ta.3}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_{sp})$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	#	#	-	-	-	#
	Dim of A_{aprt}	X	(cm)		#	-	-	-	#
		Y	(cm)		#	-	-	-	#
Other Information	t_p	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length	FL_x	(cm)		#	-	-		#
		FL_y	(cm)		#	-	-		#
	$I_{pa.3}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	B-Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	B Tx Power		(%)						
	CFM Box start		(cm)						
	CFM Box end		(cm)						
	CFM Box angle		(Degree)						
	CFM Tx power		(%)						
	Ensemble								
	Line Density								
	Flow Res								
	Velocity Range		(kHz)						
	CFM Quality								
	CFM Frequency								

A-1-59 Table for RAB4-8L at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB4-8L

Operating Mode: M-Mode
(Simultaneous B-Mode incl.)

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1	A_{aprt}>1		
Global Maximum Index Value				(a)	-	-	<1	<1	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_{a}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	-		#	#
	min of $[P_a(z_x), I_{ta.a}(z_x)]$	$[W_{.3}(z_1) \cdot I_{TA.3}(z_1)]$	(mW)				#		
	z_x	z_1	(cm)				#		
	z_{ap}	z_{bp}	(cm)				#		
	z_b	z_{sp}	(cm)					#	
	z at max. $I_{pa.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_x)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	-	#	#	#
	Dim of A_{aprt}	X	(cm)		-	-	#	#	#
		Y	(cm)		-	-	#	#	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	-	#	#	#
			FL_y (cm)		-	-	#		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	Power		(%)						
	Mode Type								
	Focal Depth		(cm)						

A-1-60 Table for RAB4-8L at Color Motion Mode (Mc-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB4-8L **Operating Mode:** Mc-Mode

Index Label				MI	TIS		TIB	TIC
					scan	non-scan		
						A_{aprt}≤1	A_{aprt}>1	non-scan	
Global Maximum Index Value				(a)	-	-	<1	<1	<1
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	-		#	#
	min of $[P_a(z_a), I_{ta.3}(z_a)]$	$[W_o(z_1), I_{PA.3}(z_1)]$	(mW)				#		
	z_a	z_1	(cm)				#		
	z_{ap}	z_{sp}	(cm)				#		
	z_b	z_{sp}	(cm)					#	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_a)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	-	#	#	#
	Dim of A_{aprt}	X	(cm)		-	-	#	#	#
		Y	(cm)		-	-	#	#	#
Other Information	t_d	PD	(μsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	-	#		#
			FL_y (cm)		-	-	#		#
	$I_{pa.3}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	B-Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	B Tx Power		(%)						
	Mc Tx Power		(%)						
	Ensemble								
	Flow Res								
	Velocity Range		(kHz)						
	Speed								
	Mc Frequency								

A-1-61 Table for RAB4-8L at Power Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB4-8L **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum index Value				(a)	-	-	<1	1,4	1,0
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{.3}$	(MPa)	#					
	P	W_o	(mW)		-	-		63	63
	min of $[P_a(z_1), I_{ta,a}(z_2)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				#		
	z_s	z_1	(cm)				#		
	z_{bp}	z_{bp}	(cm)				#		
	z_b	z_{sp}	(cm)					3,7	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,5	
	f_{awf}	f_c	(MHz)	#	-	-	#	3,0	3,0
	Dim of A_{aprt}	X	(cm)		-	-	#	1,9	1,9
		Y	(cm)		-	-	#	1,1	1,1
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,5	
	Focal Length		FL_x (cm)		-	-	#		11
			FL_y (cm)		-	-	#		6
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	Gate width		(cm)					0,3	0,3
	Gate pos		(cm)					6,66	6,66
	B-Imagesector angle		(Degree)					2,2	2,2
	Power		(%)					100	100

A-1-62 Table for RAB2-5 at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB2-5 **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,2	(a)	-	-	-	(a)
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_{ra}	$p_{r.3}$	(MPa)	2,3					
	P	W_o	(mW)		#	-	-	-	#
	min of $[P_a(z_s), I_{ta.a}(z_s)]$	$[W_o(z_s), I_{TA.3}(z_s)]$	(mW)						
	z_s	z_1	(cm)						
	z_{sp}	z_{sp}	(cm)						
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	4,0					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3,5	#	-	-	-	#
	Dim of A_{aprt}	X	(cm)		#	-	-	-	#
		Y	(cm)		#	-	-	-	#
Other Information	t_d	PD	(µsec)	2,5					
	prr	PRF	(Hz)	1870					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	3,6					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	218					
Operating Control Conditions	B-Imagesector start		(cm)	0,0					
	B-Imagesector end		(cm)	22,0					
	B-Imagesector angle		(Degree)	70,0					
	Quality		high						
	Zoom			1,0					
	Foc. Zones			1					
	Frequency Setting			-					
	SENS PRI			16,0					
	Power		(%)	100					
	ZoomBox start		(cm)	6,6					
	ZoomBox end		(cm)	11,0					
	ZoomBox angle		(Degree)	70,0					
	Mode Type			BFlow					
	Focal Depth		(cm)	6,0					

A-1-63 Table for RAB2-5 at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB2-5 **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	<1	-	-	-	1,3
Acoustic Parameter	Assoc.	IEC	FDA	**Units**					
		$p_{r.3}$	$p_{.3}$	(MPa)	#				
		P	W_o	(mW)		#	-	-	203
		min of $[P_a(z_s), I_{ta.a}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)					
		z_s	z_1	(cm)					
		z_{sp}	z_{sp}	(cm)					
		z_b	z_{sp}	(cm)				-	
		z at max. I_{pa}	z_{sp}	(cm)	#				
		$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)					
		f_{awf}	f_c	(MHz)	#	#	-	-	3,7
		Dim of A_{aprt}		X (cm)		#	-	-	8,4
				Y (cm)		#	-	-	1,4
Other Information		t_d	PD	(µsec)	#				
		prr	PRF	(Hz)	#				
		p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#				
		d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)				-	
		Focal Length		FL_x (cm)		#	-	-	15
				FL_y (cm)		#	-		6
		$I_{pa.a}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	#				
Operating Control Conditions		B-Imagesector start		(cm)					0.0
		B-Imagesector end		(cm)					24.0
		B-Imagesector angle		(Degree)					80.0
		B-Quality							low
		Zoom							1.0
		Foc. Zones							1
		Frequency Setting							penet
		SENS PRI							-
		B Tx Power		(%)					1
		CFM Box start		(cm)					11.9
		CFM Box end		(cm)					15.5
		CFM Box angle		(Degree)					80.0
		CFM Tx power		(%)					100
		Ensemble							22
		Line Density							1
		Flow Res							low
		Velocity Range		(kHz)					0.1
		CFM Quality							low
		CFM Frequency							high

A-1-64 Table for RAB2-5 at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB2-5

Operating Mode: M-Mode
(Simultaneous B-Mode incl.)

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	-	<1	<1	<1
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	-		#	#
	min of $[P_a(z_s), I_{ta.a}(z_s)]$	$[W_o(z_1), I_{TA.3}(z_1)]$	(mW)				#		
	z_s	z_1	(cm)						
	z_{bp}	z_{bp}	(cm)				#		
	z_b	z_{sp}	(cm)					#	
	z at max. $I_{pa.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	-	#	#	#
	Dim of A_{aprt}	X	(cm)		-	-	#	#	#
		Y	(cm)		-	-	#	#	#
Other Information	t_{ti}	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	-	#		#
			FL_y (cm)		-	-	#		#
	$I_{ta.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	Power		(%)						
	Mode Type								
	Focal Depth		(cm)						

A-1-65 Table for RAB2-5 at Color Motion Mode (Mc-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB2-5 **Operating Mode:** Mc-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan $A_{aprt} \leq 1$	$A_{aprt} > 1$	non-scan	
Global Maximum Index Value				(a)	-	-	<1	<1	<1
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter		p_{ra}	$p_{r.3}$	(MPa)	#				
		P	W_o	(mW)		-	-	#	#
		min of $[P_a(z_1), I_{ta.3}(z_{ta})]$	$[W_{.3}(z_1), I_{ta.3}(z_{ta})]$	(mW)					
	z_s		z_1	(cm)			#		
	z_{bp}		z_{sp}	(cm)			#	#	
	z_b		z_{sp}	(cm)	#				
	z at max. $I_{pa.a}$		z_{sp}	(cm)	#				
	$d_{eq}(z_b)$		$d_{eq}(z_{sp})$	(cm)				#	
	f_{awf}		f_c	(MHz)	#	-	#	#	#
	Dim of A_{aprt}		X	(cm)		-	#	#	#
			Y	(cm)		-	#	#	#
Other Information	t_d		PD	(μsec)	#				
	prr		PRF	(Hz)	#				
	p_r at max. I_{pi}		$p_r@PII_{max}$	(MPa)	#			#	
	d_{eq} at max. I_p		$d_{eq}@PII_{max}$	(cm)					
	Focal Length		FL_x	(cm)		-	#		#
			FL_y	(cm)		-	#		#
	$I_{pa.a}$ at max. MI		$I_{PA.3}@MI_{max}$	(W/cm²)	#				
Operating Control Conditions	B-Imagesector start			(cm)					
	B-Imagesector end			(cm)					
	B-Imagesector angle			(Degree)					
	B-Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	B Tx Power			(%)					
	Mc Tx Power			(%)					
	Ensemble								
	Flow Res								
	Velocity Range			(kHz)					
	Speed								
	Mc Frequency								

A-1-66 Table for RAB2-5 at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB2-5 **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	-	<1	1,4	1,1
Assoc. Acoustic Parameter	IEC	FDA	Units						
		$p_{r.a}$	(MPa)	#					
		W_o	(mW)		-	-		47	94
	min of $[P_{r.3}(z_1), I_{ta.3}(z_1)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				#		
	z_1	z_1	(cm)				#		
	z_{bp}	z_{bp}	(cm)				#		
	z_b	z_{sp}	(cm)					4,0	
	z at max. $I_{pi.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,3	
	f_{awf}	f_c	(MHz)	#	-	-	#	2,7	2,7
	Dim of A_{aprt}		X (cm)		-	-	#	1,2	2,4
			Y (cm)		-	-	#	1,4	1,4
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,3	
	Focal Length		FL_x (cm)		-	-	#		15
			FL_y (cm)		-	-	#		6
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	Gate width		(cm)					0,9	0,6
	Gate pos		(cm)					2,76	16,68
	B-Imagesector angle		(Degree)					2,2	3,3
	Power		(%)					100	100

A-1-67 Table for RAB4-8P at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB4-8P **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum index Value				1,2	(a)	-	-	-	(a)
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	p_{ra}	$p_{1.3}$	(MPa)	2,0					
	P	W_o	(mW)		#	-		-	#
	min of $[P_a(z_1), I_{ta,a}(z_1)]$	$[W_o(z_1), I_{PA.3}(z_1)]$	(mW)				-		
	z_1	z_1	(cm)				-		
	z_{ip}	z_{ip}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	4,7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	2,8	#	-	-	-	#
	Dim of A_{aprt}	X (cm)			#	-	-	-	#
		Y (cm)			#	-	-	-	#
Other Information	t_p	PD	(µsec)	0,5					
	prr	PRF	(Hz)	3400					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	3,2					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{ta,a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	255					
Operating Control Conditions	B-Imagesector start		(cm)	0,0					
	B-Imagesector end		(cm)	22,0					
	B-Imagesector angle		(Degree)	70,0					
	Quality			high					
	Zoom			1,0					
	Foc. Zones			1					
	Frequency Setting			High					
	SENS PRI			-					
	Power		(%)	100					
	ZoomBox start		(cm)	13,2					
	ZoomBox end		(cm)	17,6					
	ZoomBox angle		(Degree)	70,0					
	Mode Type			B(Harm)					
	Focal Depth		(cm)	6,0					

A-1-68 Table for RAB4-8P at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB4-8P **Operating Mode:** Color Flow

Index Label					MI	TIS			TIB	TIC
						scan	non-scan		non-scan	
							$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)		<1	-	-	-	<1
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**							
		$p_{r.3}$	(MPa)	#						
		W	(mW)			#	-		-	#
	min of $[P_r(z_1), I_{ta.3}(z_1)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)					-		
	z_1	z_1	(cm)					-		
	z_{sp}	z_{sp}	(cm)					-		
	z_b	z_{sp}	(cm)						-	
	z at max. $I_{pa.a}$	z_{sp}	(cm)	#						
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)						-	
	f_{awf}	f_c	(MHz)	#		#	-	-	-	#
	Dim of A_{aprt}	X	(cm)			#	-	-	-	#
		Y	(cm)			#	-	-	-	#
Other Information	t_d	PD	(μsec)	#						
	prr	PRF	(Hz)	#						
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#						
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)						-	
	Focal Length	FL_x	(cm)			#	-	-		#
		FL_y	(cm)			#	-	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#						
Operating Control Conditions	B-Imagesector start		(cm)							
	B-Imagesector end		(cm)							
	B-Imagesector angle		(Degree)							
	B-Quality									
	Zoom									
	Foc. Zones									
	Frequency Setting									
	SENS PRI									
	B Tx Power		(%)							
	CFM Box start		(cm)							
	CFM Box end		(cm)							
	CFM Box angle		(Degree)							
	CFM Tx power		(%)							
	Ensemble									
	Line Density									
	Flow Res									
	Velocity Range		(kHz)							
	CFM Quality									
	CFM Frequency									

A-1-69 Table for RAB4-8P at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB4-8P

Operating Mode: M-Mode
(Simultaneous B-Mode incl.)

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	-	<1	<1	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
		$p_{r.3}$	(MPa)	#					
		W_o	(mW)		-	-		#	#
	min of $[P_a(z_1), I_{sa.a}(z_1)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				#		
	z_1		(cm)				#		
	z_{bp}		(cm)				#		
	z_{sp}		(cm)					#	
	z at max. $I_{p.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_{sp})$		(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	-	#	#	#
	Dim of A_{aprt}		X (cm)		-	-	#	#	#
			Y (cm)		-	-	#	#	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	-	#		#
			FL_y (cm)		-	-	#		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions									
	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	Power		(%)						
	Mode Type								
	Focal Depth		(cm)						

A-1-70 Table for RAB4-8P at Color Motion Mode (Mc-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB4-8P **Operating Mode:** Mc-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum index Value				(a)	-	-	<1	<1	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
		p_{ra}	(MPa)	#					
		P	(mW)			-		#	#
	min of $[P_a(z_s), I_{ba,a}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_s)]$	(mW)				#		
	z_s	z_1	(cm)				#		
	z_{bp}	z_{bp}	(cm)				#		
	z_b	z_{sp}	(cm)					#	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	-	#	#	#
	Dim of A_{aprt}	X	(cm)		-	-	#	#	#
		Y	(cm)		-	-	#	#	#
Other Information	t_d	PD	(μsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	-	#		#
			FL_y (cm)		-	-	#		#
	$I_{pa.3}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	B-Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	B Tx Power		(%)						
	Mc Tx Power		(%)						
	Ensemble								
	Flow Res								
	Velocity Range		(kHz)						
	Speed								
	Mc Frequency								

A-1-71 Table for RAB4-8P at Pulsed Wave Mode (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RAB4-8P **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	-	<1	1,4	<1
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
		p_{ra}	(MPa)	#					
		W_o	(mW)		-	-		33	#
	min of $[P_a(z_s), I_{ta,3}(z_s)]$	$[W_3(z_1), I_{TA,3}(z_1)]$	(mW)				#		
	z_s	z_1	(cm)				#		
	z_{bp}	z_{bp}	(cm)				#		
	z_b	z_{sp}	(cm)					3,4	
	z at max. $I_{pi,a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,3	
	f_{awf}	f_c	(MHz)	#	-	-	#	3.0	#
	Dim of A_{aprt}		X (cm)		-	-	#	1.1	#
			Y (cm)		-	-	#	1,1	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,3	
	Focal Length		FL_x (cm)		-	-	#		#
			FL_y (cm)		-	-	#		#
	$I_{pa,a}$ at max. MI	$I_{PA,3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	Gate width		(cm)					1,5	
	Gate pos		(cm)					2,8	
	B-Imagesector angle		(Degree)					1,3	
	Power		(%)					100	

A-1-72 Table for RIC5-9 at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RIC5-9 **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum index Value				1.2	(a)	-	-	-	(a)
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	2,6					
	P	W_o	(mW)		#	-	-	-	#
	min of $[P_a(z_s), I_{ta,a}(z_s)]$	$[W_o(z_s), I_{PA.3}(z_s)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	1,5	#	-	-	-	#
	$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)		#	-	-	-	#
	f_{awf}	f_c	(MHz)	4,5	#	-	-	-	#
	Dim of A_{aprt}		X (cm)		#	-	-	-	#
			Y (cm)		#	-	-	-	#
Other Information	t_d	PD	(µsec)	0,4					
	prr	PRF	(Hz)	2900					
	p. at max. I_{pi}	$p_r@PII_{max}$	(MPa)	3,2					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}$ @ MI_{max}	(W/cm²)	304					
Operating Control Conditions	B-Image sector start		(cm)	0,0					
	B-Image sector end		(cm)	16,0					
	B-Image sector angle		(Degree)	20.0					
	Quality			low					
	Zoom			1,0					
	Foc. Zones			1					
	Frequency Setting			High					
	SENS PRI			-					
	Power		(%)	100					
	ZoomBox start		(cm)	11,2					
	ZoomBox end		(cm)	14,4					
	ZoomBox angle		(Degree)	20.0					
	Mode Type			B(Harm)					
	Focal Depth		(cm)	2,5					

A-1-73 Table for RIC5-9 at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RIC5-9 **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	<1	-	-	-	<1
Associated Acoustic Parameter	IEC	FDA	Units						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		#	-		-	#
	min of $[P_a(z_1), I_{ta.3}(z_1)]$	$[W_o(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_1	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	#	#	-	-	-	#
	Dim of A_{aprt}		X (cm)		#	-	-	-	#
			Y (cm)		#	-	-	-	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{ta.3}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm^2)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	B-Quality								
	Zoom								
	Foc. Zones								
	Frequency Seting								
	SENS PRI								
	B Tx Power		(%)						
	CFM Box start		(cm)						
	CFM Box end		(cm)						
	CFM Box angle		(Degree)						
	CFM Tx power		(%)						
	Ensemble								
	Line Density								
	Flow Res								
	Velocity Range		(kHz)						
	CFM Quality								
	CFM Frequency								

A-1-74 Table for RIC5-9 at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RIC5-9 **Operating Mode:** M-Mode (Simultaneous B-Mode incl.)

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1	A_{aprt}>1		
Global Maximum Index Value				(a)	-	<1	-	<1	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	#		#	#
	min of $[P_a(z_i), I_{ta.a}(z_i)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{sp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					#	
	z at max. $I_{pa.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	#	-	#	#
	Dim of A_{aprt}	X	(cm)		-	#	-	#	#
		Y	(cm)		-	#	-	#	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	#	-		#
			FL_y (cm)		-	#	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm^2)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	Power		(%)						
	Mode Type								
	Focal Depth		(cm)						

A-1-75 Table for RIC5-9 at Color Motion Mode (Mc-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RIC5-9 **Operating Mode:** Mc-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	<1	-	<1	<1
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)						
	P	W_o	(mW)		-	#		#	#
	min of [$P_{a,}(z_s)$, $I_{ta,a}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{sp}	z_{sp}	(cm)				-		
	z_b	z_{sp}	(cm)					#	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	#	-	#	#
	Dim of A_{aprt}		X (cm)		-	#	-	#	#
			Y (cm)		-	#	-	#	#
Other Information	t_i	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p. at max. I_p	$p_.@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	#	-		#
			FL_y (cm)		-	#	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	B-Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	B Tx Power		(%)						
	Mc Tx Power		(%)						
	Ensemble								
	Flow Res								
	Velocity Range		(kHz)						
	Speed								
	Mc Frequency								

A-1-76 Table for RIC5-9 at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RIC5-9 **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	<1	-	<1	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	#		#	#
	min of $[P_a(z_i), I_{ta.a}(z_i)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					#	
	z at max. $I_{pa.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	#	-	#	#
	Dim of A_{aprt}		X (cm)		-	#	-	#	#
			Y (cm)		-	#	-	#	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	#	-		#
			FL_y (cm)		-	#	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	#					
Operating Control Conditions	Gate width		(cm)						
	Gate pos		(cm)						
	B-Imagesector angle		(Degree)						
	Power		(%)						

A-1-77 Table for RIC5-9H at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RIC5-9H **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1.3	(a)	-	-	-	(a)
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_{ra}	$p_{r.3}$	(MPa)	2.7					
	P	W_o	(mW)		#	-		-	#
	min of $[P_a(z_i), I_{ta.3}(z_i)]$	$[W_o(z_i), I_{TA.3}(z_i)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{ip}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	2.2					
	$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	4.5	#	-	-	-	#
	Dim of A_{aprt}	X	(cm)		#	-	-	-	#
		Y	(cm)		#	-	-	-	#
Other Information	t_p	PD	(µsec)	0.5					
	prr	PRF	(Hz)	4590					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	3.7					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{ta.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	293					
Operating Control Conditions	B-Imagesector start		(cm)	0.0					
	B-Imagesector end		(cm)	16.0					
	B-Imagesector angle		(Degree)	146.3					
	Quality			high					
	Zoom			1.0					
	Foc. Zones			1					
	Frequency Setting			High					
	SENS PRI			-					
	Power		(%)	100					
	ZoomBox start		(cm)	6.4					
	ZoomBox end		(cm)	9.6					
	ZoomBox angle		(Degree)	146.3					
	Mode Type			B(Harm)					
	Focal Depth		(cm)	4.0					

A-1-78 Table for RIC5-9H at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RIC5-9H **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	<1	-	-	-	1,2
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
		$p_{r.3}$	(MPa)	#					
		W	(mW)		#	-		-	86
	min of $[P_a(z_s), I_{ta.3}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{sp}	z_{sp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	#	#	-	-	-	5,0
	Dim of A_{aprt}		X (cm)		#	-	-	-	4,4
			Y (cm)		#	-	-	-	0,6
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p. at max. I_β	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_β	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		8
			FL_y (cm)		#	-	-		3,5
	$I_{pa.3}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						0,0
	B-Imagesector end		(cm)						16,0
	B-Imagesector angle		(Degree)						146,3
	B-Quality								low
	Zoom								1,0
	Foc. Zones								1
	Frequency Setting								norm
	SENS PRI								-
	B Tx Power		(%)						1
	CFM Box start		(cm)						10,8
	CFM Box end		(cm)						13,2
	CFM Box angle		(Degree)						146,3
	CFM Tx power		(%)						100
	Ensemble								31
	Line Density								1
	Flow Res								high
	Velocity Range		(kHz)						4,0
	CFM Quality								norm
	CFM Frequency								low

A-1-79 Table for RIC5-9H at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RIC5-9H

Operating Mode: M-Mode
(Simultaneous B-Mode incl.)

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	<1	-	<1	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r.3}$	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	#		#	#
	min of $[P_{a}(z_1), I_{ta.3}(z_{ta})]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{sp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					#	
	z at max. $I_{ta.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	#	-	#	#
	Dim of A_{aprt}	X	(cm)		-	#	-	#	#
		Y	(cm)		-	#	-	#	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p, at max. I_p	p_r@PII$_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	#	-		#
			FL_y (cm)		-	#	-		#
	$I_{pa.a}$ at max. MI	$I_{pA.3}$ @MI$_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	Power		(%)						
	Mode Type								
	Focal Depth		(cm)						

A-1-80 Table for RIC5-9H at Color Motion Mode (Mc-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RIC5-9H **Operating Mode:** Mc-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1	A_{aprt}>1		
Global Maximum index Value				(a)	-	<1	-	1.2	<1
	IEC	**FDA**	**Units**						
Assoc. Acoustic Parameter	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	#	-	14	#
	min of $[P_a(z_a), I_{ta,a}(z_a)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)						
	z_a	z_1	(cm)				-		
	z_{ap}	z_{ap}	(cm)				-		
	z_b	z_{ap}	(cm)					1.6	
	z at max. I_{pa}	z_{ap}	(cm)	#					
	$d_{eq}(z_a)$	$d_{eq}(z_{ap})$	(cm)					0.2	
	f_{awf}	f_c	(MHz)	#	-	#	-	5.0	#
	Dim of A_{aprt}	X	(cm)		-	#	-	0.7	#
		Y	(cm)		-	#	-	0.6	#
Other Information	t_a	PD	(μsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_a	p_r@PII$_{max}$	(MPa)	#					
	d_{eq} at max. I_p	d_{eq}@PII$_{max}$	(cm)					0.2	
	Focal Length		FL_x (cm)		-	#	-		#
			FL_y (cm)		-	#	-		#
	$I_{pa,a}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)					0.0	
	B-Imagesector end		(cm)					16.0	
	B-Imagesector angle		(Degree)					20	
	B-Quality							low	
	Zoom							1.0	
	Foc. Zones							1	
	Frequency Setting							norm	
	SENS PRI							-	
	B Tx Power		(%)					1	
	Mc Tx Power		(%)					100	
	Ensemble							12	
	Flow Res							high	
	Velocity Range		(kHz)					2.4	
	Speed							4	
	Mc Frequency							Low	

A-1-81 Table for RIC5-9H at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RIC5-9H **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	1,3	-	1,3	1,3
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	56		56	56
	min of $[P_a(z_i), I_{ta.a}(z_i)]$	$[W_{.3}(z_i), I_{TA.3}(z_i)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_p	z_{sp}	(cm)					1,6	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)					0,6	
	f_{awf}	f_c	(MHz)	#	-	5,0	-	5,0	5,0
	Dim of A_{aprt}	X	(cm)		-	1,5	-	1,5	1,5
		Y	(cm)		-	0,6	-	0,6	0,6
Other Information	t_d	PD	(μsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)					0,5	
	Focal Length		FL_x (cm)		-	8	-		8
			FL_y (cm)		-	3,5	-		3,5
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm^2)	#					
Operating Control Conditions	Gate width		(cm)			0,9		0,9	0,9
	Gate pos		(cm)			3,5		3,5	3,5
	B-Imagesector angle		(Degree)			7		7	7
	Power		(%)			100		100	100

A-1-82 Tables for RIC5-9W at 2 D Mode (B-Mode)

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RIC5-9W **Operating Mode:** B-Mode

Index		MI	TIS	TIS	TIS	TIB	TIB	TIC
			Scanning	Non-Scanning $A_{aprt} \leq 1$	Non-Scanning $A_{aprt} > 1$	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units						
Acoustic working frequency	f_{awf}	(MHz)	4,2	8,6	-	-	8,6	-	
Output Power	P	(mW)			-	-		-	31
Bounded output Power	P_1	(mW)		7			7		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,12					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,07					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,1						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,5						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2,7
Equivalent aperture diameter	D_{eq}	(cm)				-			1,9
Depth for *7IS*	z_S	(cm)				-			
Depth for *7IB*	z_B	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,7						

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RIC5-9W **Operating Mode:** B-Mode

Index Label			MI	TIS			TIB	TIC
				scan	non-scan $A_{aprt} \leq 1$	non-scan $A_{aprt} > 1$	non-scan	
Global Maximum Index Value			1,2	0,3	-	-	-	0,4
Assoc. Acoustic Parameter	IEC	FDA	Units					
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,5				
	P	W_o	(mW)		8	-	-	31
	min of $[P_\alpha(z_i), I_{ta,\alpha}(z_i)]$	$[W_{.3}(z_i), I_{PA.3}(z_i)]$	(mW)			-		
	z_s	z_1	(cm)			-		
	z_{sp}	z_{sp}	(cm)			-		
	z_b	z_{sp}	(cm)				-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1,7				
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)				-	
	f_{awf}	f_c	(MHz)	4,2	8,6	-	-	3,8
	Dim of A_{aprt}	X	(cm)		1,2	-	-	4,5
		Y	(cm)		0,6	-	-	0,6
Other Information	t_d	PD	(µsec)	0,3				
	prr	PRF	(Hz)	2960				
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	3,1				
	d_{eq} at max. I_{pi}	$d_{eq}@PII_{max}$	(cm)				-	
	Focal Length	FL_x	(cm)		4,0	-	-	8,0
		FL_y	(cm)		3,5	-	-	3,5
	$I_{pa.\alpha}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	227				
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0			0,0
	B-Imagesector end		(cm)	16,0	16,0			16,0
	B-Imagesector angle		(Degree)	146,3	20,0			146,3
	Quality			high	high			high
	Zoom			1,0	1,0			1,0
	Foc. Zones			1	1			1
	Frequency Setting			High	-			Low
	SENS PRI			-	1,0			-
	Power		(%)	100	100			100
	ZoomBox start		(cm)	0,0	2,1			4,3
	ZoomBox end		(cm)	3,2	5,3			7,5
	ZoomBox angle		(Degree)	146,3	17,5			146,3
	Mode Type			B(Harm)	BFlow			B(Harm)
	Focal Depth		(cm)	2,5	4,0			8,0

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RIC5-9W **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1	A_{aprt}>1		
Global Maximum Index Value				1,2	0,2	-	-	-	0,6
	IEC	**FDA**	**Units**						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,7					
	P	W_o	(mW)		33	-		-	41
	min of [$P_\alpha(z_s)$, $I_{ta,\alpha}(z_s)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
Assoc.	z_s	z_1	(cm)				-		
Acoustic	z_{bp}	z_{bp}	(cm)				-		
Parameter	z_b	z_{sp}	(cm)					-	
	z at max. I_{α}	z_{sp}	(cm)	0,6					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5,0	5,0	-	-	-	5,0
	Dim of A_{aprt}		X (cm)		3,5	-	-	-	4,4
			Y (cm)		0,6	-	-	-	0,6
	t_d	PD	(µsec)	0,8					
	prr	PRF	(Hz)	1420					
	p_r at max. I_{α}	p_r@PII_{max}	(MPa)	3,0					
Other	d_{eq} at max. I_{α}	d_{eq}@PII_{max}	(cm)					-	
Information	Focal Length		FL_x (cm)		1,0	-	-		8,0
			FL_y (cm)		3,5	-	-		3,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	354					
	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	16,0	16,0				16,0
	B-Imagesector angle		(Degree)	146,3	146,3				146,3
	B-Quality			low	low				low
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
Operating	Frequency Setting			resol	resol				resol
Control	SENS PRI			-	-				-
Conditions	B Tx Power		(%)	1	1				1
	CFM Box start		(cm)	0,0	0,0				7,9
	CFM Box end		(cm)	2,4	2,4				10,3
	CFM Box angle		(Degree)	146,3	146,3				146,3
	CFM Tx power		(%)	100	100				100
	Ensemble			7,0	9,0				31,0
	Line Density			1	2				1
	Flow Res			high	low				low
	Velocity Range		(kHz)	0,1	0,1				5,0
	CFM Quality			low	high				norm
	CFM Frequency			low	low				low

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RIC5-9W **Operating Mode:** Color Flow

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					A_{aprt}≤1	A_{aprt}>1			
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	5,0	5,0	-	-	5,0	-	
Output Power	P	(mW)			-	-		-	41
Bounded output Power	P_1	(mW)		9			9		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,35					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,29					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,0						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,7						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			2,7
Equivalent aperture diameter	D_{eq}	(cm)				-			1,8
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	0,6						

A-1-84 Tables for RIC5-9W at Motion Mode (M-Mode)

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RIC5-9W **Operating Mode:** B+M-Mode

Index Label			MI	TIS			TIB	TIC
				scan	non-scan		non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			1,1	0,2	-	-	-	0,4
	IEC	**FDA**	**Units**					
Assoc. Acoustic Parameter	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,2				
	P	W_o	(mW)		22	-	-	22
	min of $[P_\alpha(z_i), I_{ta,\alpha}(z_i)]$	$[W_{.3}(z_i), I_{TA.3}(z_i)]$	(mW)			-		
	z_s	z_1	(cm)			-		
	z_{bp}	z_{bp}	(cm)			-		
	z_p	z_{sp}	(cm)				-	
	z at max. $I_{p,\alpha}$	z_{sp}	(cm)	1,6				
	$d_{eq}(z_p)$	$d_{eq}(z_{sp})$	(cm)				-	
	f_{awf}	f_c	(MHz)	3,9	3,7	-	-	3,7
	Dim of A_{aprt}	X (cm)			1,4	-	-	1,4
		Y (cm)			0,6	-	-	0,6
Other Information	t_d	PD	(µsec)	0,6				
	prr	PRF	(Hz)	450				
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	2,6				
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)				-	
	Focal Length	FL_x (cm)			6,0	-	-	6,0
		FL_y (cm)			3,5	-	-	3,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	201				
Operating Control Conditions	B-Image-sector start		(cm)	0,0	0,0			0,0
	B-Image-sector end		(cm)	16,0	16,0			16,0
	B-Image-sector angle		(Degree)	146,3	146,3			146,3
	Quality			low	low			low
	Zoom			1,0	1,0			1,0
	Foc. Zones			2	1			1
	Frequency Setting			Low	Low			Low
	SENS PRI			-	-			-
	Power		(%)	100	100			100
	Mode Type			M(Harm)	M(Harm)			M(Harm)
	Focal Depth		(cm)	2,5	6,0			6,0

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RIC5-9W **Operating Mode:** B+M-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning $A_{aprt} \leq 1$	Non-Scanning $A_{aprt} > 1$	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	**notation acc. Standard (DD.7)**	**Units**							
Acoustic working frequency	f_{awf}	(MHz)	3,9	3,7	-	-	3,9	-	
Output Power	P	(mW)			-	-		-	22
Bounded output Power	P_1	(mW)		10			20		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,17					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,11					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	2,6						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,2						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0,8
Equivalent aperture diameter	D_{eq}	(cm)				-			1,0
Depth for *ZS*	z_S	(cm)				-			
Depth for *ZB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,6						

Acoustic Output Reporting Table for IEC60601-2-37

(acc. to Table 101)

Transducer Model: RIC5-9W **Operating Mode:** cM-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,3	0,8	-	-	-	0,8
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	3,0					
	P	W_0	(mW)		35	-		-	35
	min of $[P_\alpha(z_s), I_{ta,\alpha}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pi,\alpha}$	z_{sp}	(cm)	1,7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5,8	5,0	-	-	-	5,0
	Dim of A_{aprt}		X (cm)		1,5	-	-	-	1,5
			Y (cm)		0,6	-	-	-	0,6
Other Information	t_d	PD	(µsec)	0,8					
	prr	PRF	(Hz)	150					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	3,9					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		8,0	-	-		8,0
			FL_y (cm)		3,5	-	-		3,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	416					
Operating Control Conditions	B-Imagesector start		(cm)	0,0	0,0				0,0
	B-Imagesector end		(cm)	16,0	16,0				16,0
	B-Imagesector angle		(Degree)	20	20				20
	B-Quality			low	low				low
	Zoom			1,0	1,0				1,0
	Foc. Zones			1	1				1
	Frequency Setting			resol	resol				resol
	SENS PRI			-	-				-
	B Tx Power		(%)	1	1				1
	Mc Tx Power		(%)	100	100				100
	Ensemble			16	16				16
	Flow Res			high	high				high
	Velocity Range		(kHz)	0,1	0,9				0,9
	Speed			5,0	5,0				5,0
	Mc Frequency			Mid	Low				Low

Summary of measured quantities for index determination

(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RIC5-9W **Operating Mode:** cM-Mode

Index			MI	TIS	TIS	TIS	TIB	TIB	TIC
				Scanning	Non-Scanning	Non-Scanning	Scanning	Non-Scanning	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$			
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units							
Acoustic working frequency	f_{awf}	(MHz)	5,8	5,0	-	-	5,0	-	
Output Power	P	(mW)			-	-		-	35
Bounded output Power	P_1	(mW)		35			62		
Attenuated output power	P_α	(mW)				-		-	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-		-	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-		-	
pulse intensity integral	I_{pi}	(mWs/cm²)	0,79					-	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mWs/cm²)	0,40					-	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,9						
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	3,0						
-12 dB output beam area	A_{aprt}	(cm²)			-	-			0,9
Equivalent aperture diameter	D_{eq}	(cm)				-			1,1
Depth for *TIS*	z_s	(cm)				-			
Depth for *TIB*	z_b	(cm)						-	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	1,7						

A-1-86 Tables for RIC5-9W at Pulsed Wave Doppler (PW-Mode)

Summary of measured quantities for index determination
(according 60601-2-37 DD.7, Table DD.2)

Transducer Model: RIC5-9W **Operating Mode:** Pulsed Doppler

Index		MI	TIS	TIS	TIS	TIB	TIB	TIC
			Scanning	Non-Scanning A_{aprt}≤1	Non-Scanning A_{aprt}>1	Scanning	Non-Scanning	
notation acc. Test Report (DD2)	notation acc. Standard (DD.7)	Units						
Acoustic working frequency	f_{awf}	(MHz)	4,5	-	5,0	-	4,5	
Output Power	P	(mW)			35	-	24	35
Bounded output Power	P_1	(mW)		-		-		
Attenuated output power	P_α	(mW)				-	12.1	
Spatial-peak temporal average intensity	I_{zpta}	(mW/cm²)				-	359	
Attenuated spatial-peak temporal-average intensity	$I_{zpta,\alpha}$	(mW/cm²)				-	179	
pulse intensity integral	I_{pi}	(mW/cm²)	0,28				0,28	
Attenuated pulse intensity integral	$I_{pi,\alpha}$	(mW/cm²)	0,14				0,14	
Peak-rarefactional acoustic pressure	p_r	(MPa)	3,4					
Attenuated peak-rarefactional acoustic pressure	$p_{r,\alpha}$	(MPa)	2,5					
-12 dB output beam area	A_{aprt}	(cm²)			0,9	-		0,9
Equivalent aperture diameter	D_{eq}	(cm)				-		1,1
Depth for *TIS*	z_s	(cm)				-		
Depth for *TIB*	z_b	(cm)					2,1	
Depth at max. attenuated pulse-intensity integral	z at max. $I_{pi,\alpha}$	(cm)	2,2					

Acoustic Output Reporting Table for IEC60601-2-37
(acc. to Table 101)

Transducer Model: RIC5-9W **Operating Mode:** Pulsed Doppler

Index Label			MI	TIS			TIB	TIC
				scan	non-scan		non-scan	
					A_{aprt}≤1	A_{aprt}>1		
Global Maximum Index Value			1,2	-	0,8	-	0,8	0,8
Assoc. Acoustic Parameter	IEC	FDA	Units					
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	2,5				
	P	W_o	(mW)		-	35	24	35
	min of $[P_1(z_1), I_{ta,\alpha}(z_1)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)			-		
	z_1	z_1	(cm)			-		
	z_{ap}	z_{ap}	(cm)			-		
	z_{sp}	z_{sp}	(cm)				2,1	
	z at max. $I_{p,\alpha}$	z_{sp}	(cm)	2,2				
	$d_{eq}(z_{sp})$	$d_{eq}(z_{sp})$	(cm)				0,3	
	f_{awf}	f_c	(MHz)	4,5	-	5,0	4,5	5,0
	Dim of A_{aprt}	X	(cm)		-	1,5	1,0	1,5
		Y	(cm)		-	0,6	0,6	0,6
Other Information	t_d	PD	(µsec)	0,5				
	prr	PRF	(Hz)	1300				
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	3,4				
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)				0,3	
Focal Length			FL_x (cm)		-	8,0	-	8,0
			FL_y (cm)		-	3,5	-	3,5
	$I_{pa,\alpha}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	257				
Operating Control Conditions	Gate width		(cm)	0,1		0,2	0,1	0,2
	Gate pos		(cm)	0,0		3,3	0,0	3,3
	Velocity Range		(kHz)	1,3		7,0	1,3	7,0
	Power		(%)	100		100	100	100

A-1-87 Table for RSP5-12 at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3

Transducer Model: RSP5-12 **Operating Mode:** B-Mode

Index Label			MI	TIS			TIB	TIC
				scan	non-scan		non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			1,3	(a)	-	-	-	(a)
Acoustic Parameter	Assoc.	$p_{r.3}$	3,3					
		W_o		#	-		-	#
		min of $[W_{.3}(z_1), I_{TA.3}(z_1)]$				-		
		z_1				-		
		z_{ap}				-		
		z_{sp}	1,1				-	
		$d_{eq}(z_{sp})$					-	
		f_c	6,3	#	-	-	-	#
		Dim of A_{aprt} X		#	-	-	-	#
		Dim of A_{aprt} Y		#	-	-	-	#
Other Information		PD	0,2					
		PRF	11270					
		p_r@PII_{max}	4,0					
		d_{eq}@PII_{max}					-	
		Focal	FLx	#	-	-		#
		Length	FLy	#	-	-		#
		$I_{PA.3}$ @MI_{max}	542					
Operating Control Conditions		Tx frequency	7,5					
		Tx focus	1.6					
		Tx power	4					
		Quality	high					
		Box start	0,0					
		Box end	1.6					
		Box width	3,74					
		B-Imagesector width	3,74					
		Frequency Setting	penet					

A-1-88 Table for RSP5-12 at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3

Transducer Model: RSP5-12 **Operating Mode:** Color Flow

Index Label			MI	TIS			TIB	TIC
				scan	non-scan		non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		(a)		<1	-	-	-	<1
Assoc. Acoustic Parameter	$p_{r.3}$	(MPa)	#					
	W_o	(mW)		#	-		-	#
	min of $[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_1	(cm)				-		
	z_{bp}	(cm)				-		
	z_{sp}	(cm)	#				-	
	$d_{eq}(z_{sp})$	(cm)					-	
	f_c	(MHz)	#	#	-	-	-	#
	Dim of A_{aprt}	X (cm)		#	-	-	-	#
		Y (cm)		#	-	-	-	#
Other Information	PD	(µsec)	#					
	PRF	(Hz)	#					
	p_r@PII$_{max}$	(MPa)	#					
	d_{eq}@PII$_{max}$	(cm)					-	
	Focal Length	FLx (cm)		#	-	-		#
		FLy (cm)		#	-	-		#
	$I_{PA.3}$@MI$_{max}$		#					
Operating Control Conditions	Tx frequency	(MHz)						
	Tx focus	(cm)						
	Tx power							
	Ensemble							
	Line Density							
	Velocity Range	(kHz)						
	Quality							
	CFM Box start	(cm)						
	CFM Box end	(cm)						
	CFM Box witdh	(cm)						
	B Image width	(cm)						

A-1-89 Table for RSP5-12 at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3

Transducer Model: RSP5-12 **Operating Mode:** Pulsed Doppler

Index Label			MI	TIS			TIB	TIC
				scan	non-scan		non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		(a)	<1	<1	-	1,8	1,1	
Assoc. Acoustic Parameter	$p_{r.3}$	(MPa)	#					
	W_0	(mW)		#	#	29	30	
	min of [$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_1	(cm)				-		
	z_{bp}	(cm)				-		
	z_{sp}	(cm)	#				0,9	
	$d_{eq}(z_{sp})$	(cm)					0,3	
	f_c	(MHz)	#	#	#	-	5,0	5,9
	Dim of A_{aprt}	X (cm)		#	#	-	1,0	1,0
		Y (cm)		#	#	-	0,4	0,4
Other Information	PD	(µsec)	#					
	PRF	(Hz)	#					
	p_r@PII$_{max}$	(MPa)	#					
	d_{eq}@PII$_{max}$	(cm)					0,3	
	Focal	FLx (cm)		#	#	-		4,5
	Length	FLy (cm)		#	#	-		1,7
	$I_{PA.3}$ @MI$_{max}$		#					
Operating Control Conditions	Tx frequency	(MHz)					5,0	6,0
	Tx focus	(cm)					4,5	4,5
	Tx power						-2	-2
	Gate pos	(cm)					0,9	0,9
	prf	(kHz)					2,2	2,2
	Sample Volume (Gate)	(mm)					0,7	0,7

A-1-90 Table for RSP5-12 at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3

Transducer Model: RSP5-12 **Operating Mode:** M-Mode (Simultaneous B-Mode incl.)

Index Label			MI	TIS			TIB	TIC
				scan	non-scan		non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value		(a)	<1	<1	-	<1	<1	
Assoc. Acoustic Parameter	$p_{r.3}$	(MPa)	#					
	W_o	(mW)		#	#		#	#
	min of [$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)				-		
	z_1	(cm)				-		
	z_{bp}	(cm)				-		
	z_{sp}	(cm)	#				#	
	$d_{eq}(z_{sp})$	(cm)					#	
	f_c	(MHz)	#	#	#	-	#	#
	Dim of A_{aprt}	X (cm)		#	#	-	#	#
		Y (cm)		#	#	-	#	#
Other Information	PD	(µsec)	#					
	PRF	(Hz)	#					
	p_r@PII_{max}	(MPa)	#					
	d_{eq}@PII_{max}	(cm)					#	
	Focal Length	FLx (cm)		#	#	-		#
		FLy (cm)		#	#	-		#
	$I_{PA.3}$ @MI_{max}		#					
Operating Control	Tx frequency	(MHz)						
	Tx focus							
	Tx power							
	Frequency Setting							

A-1-91 Table for RSP6-16 at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RSP6-16 **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1.2	(a)	-	-	-	(a)
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_a	$p_{r,3}$	(MPa)	2.9					
	P	W_o	(mW)		#	-		-	#
	min of $[P_{a}(z_s), I_{ta,3}(z_s)]$	$[W_{.3}(z_1), I_{TA,3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{ap}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	1.1					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	5.3	#	-	-	-	#
	Dim of A_{aprt}	X	(cm)		#	-	-	-	#
		Y	(cm)		#	-	-	-	#
Other Information	t_p	PD	(µsec)	0.5					
	prr	PRF	(Hz)	11420					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	3.5					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{pa.3}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	209					
Operating Control Conditions	B-Imagesector start		(cm)	0.0					
	B-Imagesector end		(cm)	7.9					
	B-Imagesector width		(cm)	3.7					
	Quality			high					
	Zoom			1.0					
	Foc. Zones			1					
	Frequency Setting			Low					
	SENS PRI			-					
	Power		(%)	100					
	ZoomBox start		(cm)	0.0					
	ZoomBox end		(cm)	1.6					
	ZoomBox width		(cm)	2.2					
	Mode Type			B(Harm)					
	Focal Depth		(cm)	1.6					

A-1-92 Table for RSP6-16 at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RSP6-16 **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			(a)		<1	-	-	-	1.0
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		#	-		-	64
	min of $[P_a(z_i), I_{ta,3}(z_i)]$	$[W_{.3}(z_i), I_{TA.3}(z_i)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{sp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_{sp})$	$d_{aq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	#	#	-	-	-	7.4
	Dim of A_{aprt}	X (cm)			#	-	-	-	4.9
		Y (cm)			#	-	-	-	0.4
Other Information	t_s	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	d_{aq}@PII$_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		6
			FL_y (cm)		#	-	-		1.5
	$I_{pa,a}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						0.0
	B-Imagesector end		(cm)						7.9
	B-Imagesector width		(cm)						3.7
	B-Quality								low
	Zoom								1.0
	Foc. Zones								1
	Frequency Setting								norm
	SENS PRI								-
	B Tx Power		(%)						1
	CFM Box start		(cm)						4.8
	CFM Box end		(cm)						5.9
	CFM Box width		(cm)						3.7
	CFM Tx power		(%)						100
	Ensemble								31
	Line Density								1
	Flow Res								high
	Velocity Range		(kHz)						9.0
	CFM Quality								norm
	CFM Frequency								high

A-1-93 Table for RSP6-16 at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RSP6-16

Operating Mode: M-Mode
(Simultaneous B-Mode incl.)

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	<1	-	<1	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
		$p_{r.3}$	(MPa)	#					
		W$_o$	(mW)		-	#		#	#
	min of [$P_A(z_1)$, $I_{ta.A}(z_1)$]	[$W_{.3}(z_1)$, $I_{TA.3}(z_1)$]	(mW)						
	z_1	z_1	(cm)						
	z_{ap}	z_{sp}	(cm)						
	z_b	z_{sp}	(cm)					#	
	z at max. $I_{pi.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	#	-	#	#
	Dim of A_{aprt}		X (cm)		-	#	-	#	#
			Y (cm)		-	#	-	#	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	#	-		#
			FL_y (cm)		-	#	-		#
	$I_{ta.a}$ at max. MI	$I_{PA.3}$@MI$_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector width		(cm)						
	Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	Power		(%)						
	Mode Type								
	Focal Depth		(cm)						

A-1-94 Table for RSP6-16 at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RSP6-16 **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	1,0	-	1,4	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	28		26	#
	min of $[P_a(z_s), I_{ta.a}(z_s)]$	$[W_{.3}(z_s), I_{TA.3}(z_s)]$	(mW)					-	
	z_s	z_1	(cm)					-	
	z_{sp}	z_{sp}	(cm)					-	
	z_b	z_{sp}	(cm)					0,7	
	z at max. I_{pa}	z_{sp}	(cm)	#					
	$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)					0,3	
	f_{awf}	f_c	(MHz)	#	-	7,4	-	6.0	#
	Dim of A_{aprt}		X (cm)		-	1,2	-	1,2	#
			Y (cm)		-	0,4	-	0,4	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pa}	$d_{eq}@PII_{max}$	(cm)					0,3	
	Focal Length		FL_x (cm)		-	6	-		#
			FL_y (cm)		-	1,5	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}$ @MI_{max}	(W/cm²)	#					
Operating Control Conditions	Gate width		(cm)			0,1		0,1	
	Gate pos		(cm)			3,2		3,2	
	B-Imagesector angle		(Degree)			1,3		3,3	
	Power		(%)			100		100	

A-1-95 Table for RNA5-9 at 2 D Mode (B-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RNA5-9 **Operating Mode:** B-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				1,3	(a)	-	-	-	(a)
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	p_{ra}	$p_{r.3}$	(MPa)	2,4					
	P	W_o	(mW)		#	-		-	#
	min of $[P_{at}(z_s), I_{ta,a}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{sp}	z_{sp}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. I_{pa}	z_{sp}	(cm)	1,7					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	3,8	#	-	-	-	#
	Dim of A_{aprt}	X	(cm)		#	-	-	-	#
		Y	(cm)		#	-	-	-	#
Other Information	t_d	PD	(µsec)	0,6					
	prr	PRF	(Hz)	6590					
	p_r at max. I_{pi}	$p_r@PII_{max}$	(MPa)	3,0					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	198					
Operating Control Conditions	B-Imagesector start		(cm)	0,0					
	B-Imagesector end		(cm)	18,0					
	B-Imagesector angle		(Degree)	117,2					
	Quality			high					
	Zoom			1,0					
	Foc. Zones			1					
	Frequency Setting			Low					
	SENS PRI			-					
	Power		(%)	100					
	ZoomBox start		(cm)	4,2					
	ZoomBox end		(cm)	7,8					
	ZoomBox angle		(Degree)	117,2					
	Mode Type			B(Harm)					
	Focal Depth		(cm)	3,5					

A-1-96 Table for RNA5-9 at Color Flow Mode (CFM-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RNA5-9 **Operating Mode:** Color Flow

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	<1	-	-	-	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r.3}$	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		#	-	-	-	#
	min of $[P_a(z_1), I_{ta.3}(z_1)]$	$[W_o(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{sp}	z_{ap}	(cm)				-		
	z_b	z_{sp}	(cm)					-	
	z at max. $I_{pa.3}$	z_{sp}	(cm)	#					
	$d_{eq}(z_{sp})$	$d_{eq}(z_{sp})$	(cm)					-	
	f_{awf}	f_c	(MHz)	#	#	-	-	-	#
	Dim of A_{aprt}		X (cm)		#	-	-	-	#
			Y (cm)		#	-	-	-	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					-	
	Focal Length		FL_x (cm)		#	-	-		#
			FL_y (cm)		#	-	-		#
	$I_{pa.3}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm^2)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	B-Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	B Tx Power		(%)						
	CFM Box start		(cm)						
	CFM Box end		(cm)						
	CFM Box angle		(Degree)						
	CFM Tx power		(%)						
	Ensemble								
	Line Density								
	Flow Res								
	Velocity Range		(kHz)						
	CFM Quality								
	CFM Frequency								

A-1-97 Table for RNA5-9 at Continuous Wave Doppler (CW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RNA5-9 **Operating Mode:** Continues Wave

Index Label			MI	TIS			TIB	TIC
				scan	non-scan		non-scan	
					$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value			(a)	-	<1	-	<1	<1
	IEC	**FDA**	**Units**					
Assoc. Acoustic Parameter	p_{ra}	$p_{r.3}$	(MPa)	#				
	P	W_o	(mW)		-	#	#	#
	min of $[P_a(z_s), \ ^{tb,a}I_{PA}(z_s)]$	$[W_{.3}(z_1), \ ^{I}I_{PA.3}(z_1)]$	(mW)			-		
	z_s	z_1	(cm)			-		
	z_{ap}	z_{ap}	(cm)			-		
	z_b	z_{sp}	(cm)				#	
	z at max. I_{pa}	z_{sp}	(cm)	#				
	$d_{eq}(z_s)$	$d_{eq}(z_{sp})$	(cm)				#	
	f_{awf}	f_c	(MHz)	#	-	#	-	#	#
	Dim of A_{aprt}		X (cm)		-	#	-	#	#
			Y (cm)		-	#	-	#	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pa}	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_{pa}	$d_{eq}@PII_{max}$	(cm)				#		
	Focal Length		FL_x (cm)		-	#	-	#	
			FL_y (cm)		-	#	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	Velocity Range		(kHz)						
	Power		(%)						

A-1-98 Table for RNA5-9 at Motion Mode (M-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RNA5-9

Operating Mode: M-Mode
(Simultaneous B-Mode incl.)

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum	Index Value			(a)	-	<1	-	<1	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
	$p_{r\alpha}$	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	#		#	#
	min of $[P_\alpha(z_\alpha), I_{\alpha.3}(z_\alpha)]$	$[W_{.3}(z_s), I_{PA.3}(z_s)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{sp}	z_{sp}	(cm)				-		
	z_b	z_{sp}	(cm)					#	
	z at max. $I_{\alpha.3}$	z_{sp}	(cm)	#					
	$d_{eq}(z_{sp})$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	#	-	#	#
	Dim of A_{aprt}	X (cm)			-	#	-	#	#
		Y (cm)			-	#	-	#	#
Other Information	t_d	PD	(μsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pa}	$p_r@PII_{max}$	(MPa)	#					
	d_{eq} at max. I_p	$d_{eq}@PII_{max}$	(cm)					#	
	Focal Length		FL_x (cm)		-	#	-		#
			FL_y (cm)		-	#	-		#
	$I_{pa.3}$ at max. MI	$I_{PA.3}@MI_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	Power		(%)						
	Mode Type								
	Focal Depth		(cm)						

A-1-99 Table for RNA5-9 at Color Motion Mode (Mc-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RNA5-9 **Operating Mode:** Mc-Mode

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						$A_{aprt} \leq 1$	$A_{aprt} > 1$		
Global Maximum Index Value				(a)	-	<1	-	<1	<1
Assoc. Acoustic Parameter	**IEC**	**FDA**	**Units**						
	$p_{r.a}$	$p_{1.3}$	(MPa)	#					
	P	W_o	(mW)		-	#		#	#
	min of $[P_a(z_s), I_{ta.3}(z_s)]$	$[W_{.3}(z_1), I_{TA.3}(z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{bp}	z_{sp}	(cm)				-		
	z_b	z_{sp}	(cm)					#	
	z at max. $I_{pa.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					#	
	f_{awf}	f_c	(MHz)	#	-	#	-	#	#
	Dim of A_{aprt}	X	(cm)		-	#	-	#	#
		Y	(cm)		-	#	-	#	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_{pi}	p_r@PII$_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					#	#
	Focal Length		FL_x (cm)		-	#	-		#
			FL_y (cm)		-	#	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	#					
Operating Control Conditions	B-Imagesector start		(cm)						
	B-Imagesector end		(cm)						
	B-Imagesector angle		(Degree)						
	B-Quality								
	Zoom								
	Foc. Zones								
	Frequency Setting								
	SENS PRI								
	B Tx Power		(%)						
	Mc Tx Power		(%)						
	Ensemble								
	Flow Res								
	Velocity Range		(kHz)						
	Speed								
	Mc Frequency								

A-1-100 Table for RNA5-9 at Pulsed Wave Doppler (PW-Mode)

Acoustic Output Reporting Table for Track 3
(provide data where global maximum displayed index exceeds 1.0)

Transducer Model: RNA5-9 **Operating Mode:** Pulsed Doppler

Index Label				MI	TIS			TIB	TIC
					scan	non-scan		non-scan	
						A_{aprt}≤1	A_{aprt}>1		
Global Maximum Index Value				(a)	-	<1	-	1,5	<1
Assoc. Acoustic Parameter	IEC	FDA	Units						
	p_{ra}	$p_{r.3}$	(MPa)	#					
	P	W_o	(mW)		-	#		42	#
	min of $[P_a(Z_x), I_{ta.a}(Z_x)]$	$[W_{.3}(Z_1), I_{TA.3}(Z_1)]$	(mW)				-		
	z_s	z_1	(cm)				-		
	z_{sp}	z_{bp}	(cm)				-		
	z_b	z_{sp}	(cm)					1.2	
	z at max. $I_{ta.a}$	z_{sp}	(cm)	#					
	$d_{eq}(z_b)$	$d_{eq}(z_{sp})$	(cm)					0,4	
	f_{awf}	f_c	(MHz)	#	-	#	-	4,3	#
	Dim of A_{aprt}		X (cm)		-	#	-	1,7	#
			Y (cm)		-	#	-	0,86	#
Other Information	t_d	PD	(µsec)	#					
	prr	PRF	(Hz)	#					
	p_r at max. I_p	p_r@PII$_{max}$	(MPa)	#					
	d_{eq} at max. I_{pi}	d_{eq}@PII$_{max}$	(cm)					0,4	
	Focal Length		FL_x (cm)		-	#	-		#
			FL_y (cm)		-	#	-		#
	$I_{pa.a}$ at max. MI	$I_{PA.3}$ @MI$_{max}$	(W/cm²)	#					
Operating Control Conditions	Gate width		(cm)					0,8	
	Gate pos		(cm)					5,6	
	B-Imagesector angle		(Degree)					2,2	
	Power		(%)					100	

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